Joint Coal Board

NEW SOUTH WALES COAL YEARBOOK 1989-90

Joint Coal Board Statistical Publications

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Annual publication containing comprehensive statistics on the NSW coal industry.

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Lost-Time Injuries, New South Wales Coal Mines
Annual publication containing lost-time injury statistics and rates.

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NEW SOUTH WALES COAL YEARBOOK 1989-90

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FOREWORD

The Joint Coal Board is pleased to release the second edition of its **New South Wales Coal Yearbook** covering the 1989-90 year.

For the NSW coal industry, 1989-90 was the first full year of operation under flexible working arrangements flowing from the Coal Industry Tribunal's September 1988 restructuring decision. Coupled with a more settled industrial climate, this provided the basis for the expansion of production to a record 78.06 million tonnes saleable coal. This was 14.5% more than in the previous year and 6.5% above the previous peak annual output recorded in 1986-87.

On the market side, export sales were sluggish in the first half of the year but increased to record levels in the second half. Shipments for the year totalled 42.75 million tonnes, 6.1% more than in 1988-89 but still short of the 43.78 million tonnes achieved in 1987-88. Further contract price increases and a fall in the value of the Australian dollar from an average of 81.4 US cents in 1988-89 to 76.7 US cents in 1989-90 provided a substantial rise in Australian dollar returns to coal exporters. The total value of coal exports for the year increased by 26.0% to $2.29 billion with the average value rising by 18.8% to $A53.69 per tonne.

Coal dispatches to the domestic market grew strongly. However, with little change in actual usage by the main consumers, power stations and the steel industry, increased domestic intake of coal resulted in rising consumer stockpiles.

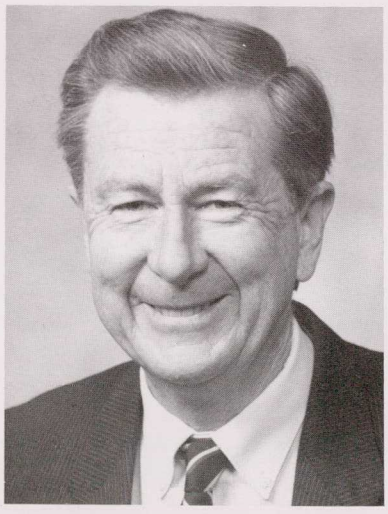
Within the industry, itself, high levels of production and sluggish export sales in the first half of the year saw coal stocks at mines and ports rise from 4.1 million tonnes in June to 7.7 million tonnes by the end of December. With the increase in the level of exports in the second half of the year, industry coal stocks stabilised at around 8 million tonnes.

Aggregate industry profit for the six months to December 1989 was estimated at $76 million compared with a loss of $15 million in the corresponding period of 1988 and a net profit of $73 million for the full 1988-89 year. The return to overall industry profitability is encouraging. However, profitability still remains patchy across the industry with several producers reporting losses for the 1989-90 year. Increased unit labour costs, despite significant productivity gains, a strengthening of the Australian dollar to an average 80.5 US cents in the September 1990 quarter and the cost of financing increased stockpiles are adversely affecting the operations of a number of producers.

The year saw important developments in the industrial arena. These included the amalgamation of the Miners' Federation and the Mechanics unions to form the United Mineworkers' Federation and the signing by the unions and producers of an Industry Restructuring Agreement designed to improve the efficiency and cost effectiveness of the coal industry. Much has already been achieved under the restructuring agreement with a new industry production and engineering award, replacing three awards, coming into effect in April 1990.

Important infrastructure developments were the merger of the operations of the Newcastle coal loading facilities of Port Waratah Coal Services Ltd and Kooragang Coal Loader Ltd and finalisation of the lease of Port Kembla coal loader to a consortium of southern and western coal producers.

Some additional features have been added in the second edition of the Yearbook. These include a detailed directory of producers and mines, an analysis of foreign ownership in the NSW coal industry and a section on new and potential mining developments. The Board wishes to thank colliery proprietors and mine personnel for their co-operation and assistance in providing information for the Yearbook. Finally, the Board extends its appreciation to those of its staff involved in the prepration of the Yearbook.



J M Wilcox
Chairman
Joint Coal Board

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Statistical Year:
The Board publishes annual statistics for both the calendar year (to the end of December and shown as, e.g. 1989) and the financial year (to the end of June and shown as, e.g. 1989-90). Most of the Board's statistics are based on weekly or fortnightly returns and annual figures in the Yearbook usually refer to a period of 52 weeks. In order to keep the Board's statistical year reasonably in line with calendar and financial years proper, it is necessary from time to time to cover 53 or 54 weeks in the statistical year.

In some tables in the Yearbook monthly data is given. Annual totals derived by summing the monthly data will not necessarily equal the Board's statistical year totals.

Photographs:
Photographs in the Yearbook were supplied by courtesy of colliery proprietors, Electricity Commission of NSW, State Rail Authority, NSW Geological & Mining Museum, Port Waratah Coal Services Ltd, Kooragang Coal Loader Ltd and Joint Coal Board staff.

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Coalfields and mining districts:

The Standing Committee on Coalfield Geology of NSW recognises five separate coalfields in NSW – Gunnedah, Hunter, Newcastle, Western and Southern. For statistical purposes the Joint Coal Board uses four mining districts – Singleton-North West, Newcastle, West and South. The boundaries of the Newcastle, West and South districts are the same as the Newcastle, Western and Southern coalfields. The Singleton-North West district incorporates the Gunnedah and Hunter coalfields.

In some of the tables and graphs in the yearbook, data is given for the North region which covers the Singleton-North West and Newcastle districts.

Symbols and other usages:

— nil
n.a. not available
0 less than half final digit
p preliminary, subject to revision
Mt million tonnes

Due to rounding, there may be discrepancies in tables between sums of component items and totals. Tonnage data is expressed in metric tonnes on a tonne for tonne basis.

DEMAND & SUPPLY

Coal train departing Ulan mine for Newcastle Port

COAL DEMAND & SUPPLY

Coal is of major importance for the economy of NSW. It currently provides about 55% of total energy consumed in the State and is the major export earner ($2.3 billion in 1989-90). Over 90% of electricity consumed in NSW is generated in coal-fired power stations and coal is a vital energy source and raw material for the steel, cement and coke industries and for general industrial and commercial boiler applications.

Annual consumption of coal in NSW has increased from 17 Mt in 1970-71 to around 28 Mt per annum in recent years. This has been primarily the result of increasing coal demand for electricity generation. Increasing export demand, however, has been the major contributing factor to the growth of the NSW coal industry over this period. Exports, which now account for about 60% of the market for NSW coal (40% in 1970-71), have increased from 12 Mt in 1970-71 to just under 43 Mt in 1989-90. Since 1970-71 coal production has more than doubled, reaching a record 78.06 Mt (saleable coal) in 1989-90.

Table 1 gives annual coal demand and supply balances for NSW, i.e. stocks at start of year plus production plus imports equals exports plus consumption plus stocks at end of year with a balancing item as defined (see note to Table 1). Stocks in Table 1 include both coal industry stocks and consumer stocks.

NSW COAL DEMAND & SUPPLY

	1988-89 (Mt)	1989-90 (Mt)
Production		
Raw	81.27	93.89
Saleable	68.18	78.06
Consumption in NSW	28.33	27.86
Exports overseas	40.27	42.75
Imports	0.39	0.31
Interstate exports	0.54	1.04
Stocks, end of year		
Mines/Ports	4.11	8.24
Consumers	6.69	9.30

Detailed statistics and notes on production, exports and consumption are given in later sections of the yearbook. Imports of coal into NSW shown in Table 1 for 1989-90 consisted mainly of Queensland, Canadian and New Zealand coal shipped to the steelworks. Interstate exports consisted mainly of coal shipped from the Port Kembla steelworks to the Whyalla steelworks in South Australia.

Table 2 gives mine balances (opening stocks plus saleable production equals deliveries plus closing stocks) for 1988-89 and 1989-90. In 1988-89 production short falls and low stock levels resulted in a fall of 2.32 Mt in coal dispatches from the mines. With a record level of production in 1989-90, coal dispatches rose by 6.02 Mt to 74.04 Mt. This was still some 4 Mt short of production and mine stocks rose over the year from 4.11 Mt to 8.24 Mt.

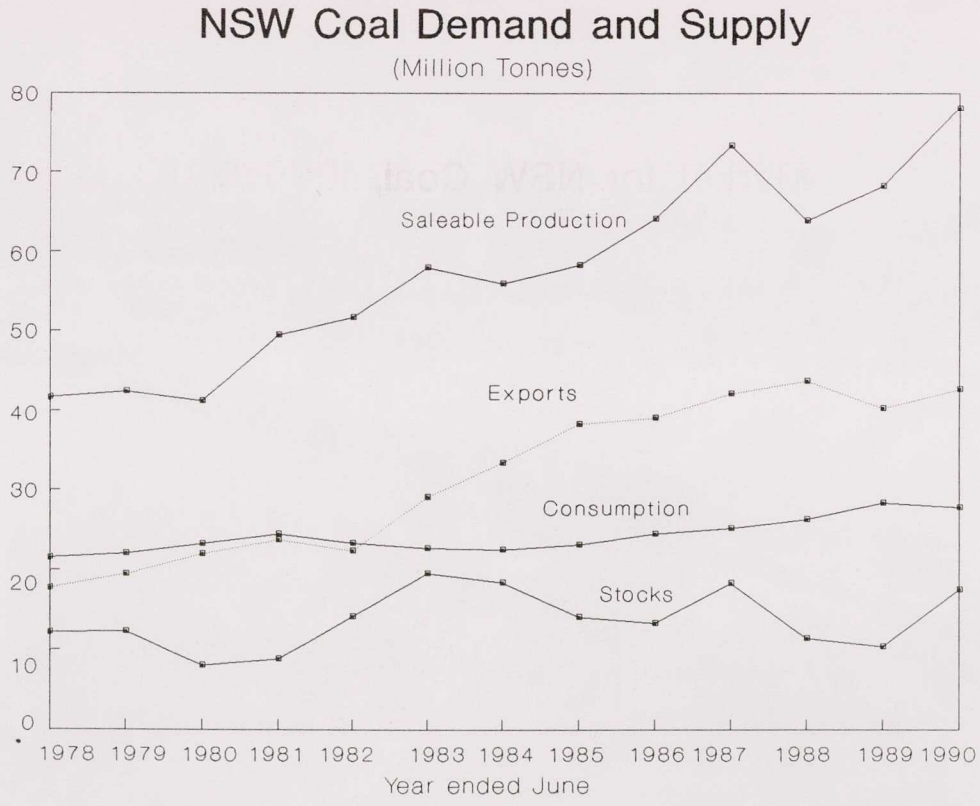
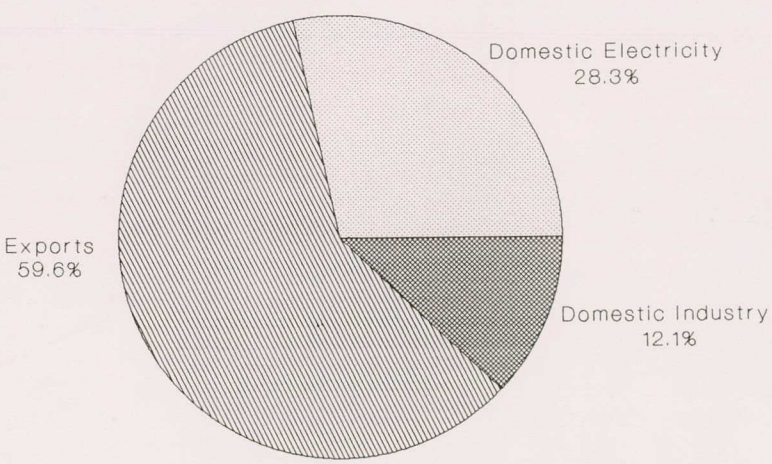


Table 1 – COAL DEMAND AND SUPPLY, NSW
('000 tonnes)

Year	Net production	Imports	Exports		Consumption	In transit and unaccounted for (a)	Stock at end of year
			Overseas	Interstate			
1980	42 738	160	22 902	623	23 440	– 30	7 685
1981	52 380	65	23 269	852	24 030	+162	12 141
1982 (b)	55 956	29	24 996	842	23 285	+136	19 139
1983	55 963	15	30 814	836	21 689	–346	21 432
1984	57 430	14	35 746	1 167	22 900	– 39	19 024
1985	62 259	16	40 702	1 189	23 985	– 94	15 329
1986	66 412	29	40 474	1 112	25 022	– 36	15 126
1987	69 879	162	42 792	985	25 495	–149	15 746
1988	65 754	380	41 896	433	27 846	–184	11 521
1989	73 141	409	40 399	723	27 485	– 70	16 394
1970-71	31 002	50	11 985	1 122	17 181	–	5 639
1971-72 (b)	31 833	16	12 649	831	17 730	–	6 278
1972-73	33 070	17	11 168	918	19 170	–	8 108
1973-74	31 866	22	12 731	909	19 110	–	7 246
1974-75	36 309	21	14 812	891	20 100	–	7 773
1975-76	34 354	117	14 054	817	18 970	–	8 404
1976-77 (b)	39 614	18	16 447	562	20 906	–	10 121
1977-78	41 688	22	17 736	428	21 480	–	12 186
1978-79	42 360	18	19 442	843	21 980	–	12 300
1979-80	41 191	61	21 866	508	23 185	–	7 993
1980-81	49 480	118	23 712	862	24 360	+122	8 779
1981-82	51 701	72	22 290	906	23 280	+ 43	14 119
1982-83 (b)	58 035	22	29 139	747	22 595	–207	19 488
1983-84	55 984	15	33 427	1 047	22 466	–143	18 404
1984-85	58 253	15	38 296	1 169	23 127	+ 25	14 105
1985-86	64 081	30	39 087	1 225	24 548	+ 24	13 380
1986-87	73 312	108	42 189	921	25 153	–112	18 425
1987-88	63 945	190	43 778	667	26 322	–277	11 516
1988-89 (b)	68 176	390	40 274	537	28 327	–150	10 794
1989-90	78 058	306	42 746	1 045	27 858	+ 34	17 543

(a) Includes dump adjustments at ports and rejects on coal exported from BHP steelworks.
(b) 53-week year.

Market for NSW Coal, 1989-90



COAL FLOW DIAGRAM, NEW SOUTH WALES, 1989 – 90

MILLION TONNES

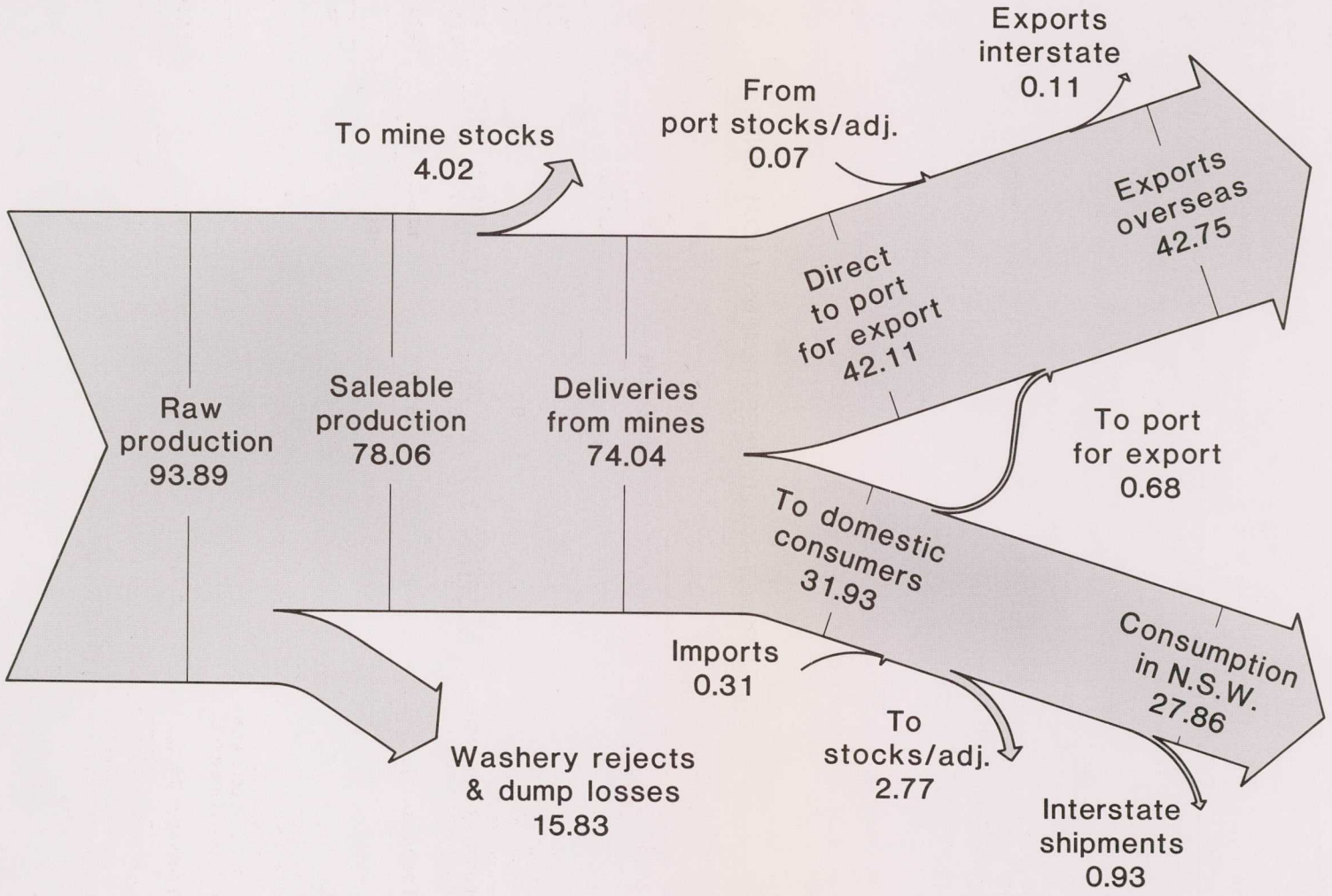


Table 2 – PRODUCTION, DELIVERIES & STOCKS, NSW COAL MINES
('000 tonnes)

	Singleton-North West	Newcastle	West	South	NSW
			1988-89(b)		
Opening stock	1 487.2	313.3	415.7	644.2	2 860.4
Production –					
Raw	33 333.8	17 702.3	13 605.8	16 629.9	81 271.8
Saleable	27 026.7	15 474.0	10 799.3	14 875.8	68 175.8
Deliveries(a)	27 448.9	15 217.0	10 644.8	14 706.0	68 016.7
Closing stock	1 065.0	570.3	570.2	814.0	3 019.5
			1989-90		
Opening stock	1 065.0	570.3	570.2	814.0	3 019.5
Production –					
Raw	41 460.0	20 203.6	13 284.9	18 944.8	93 893.3
Saleable	33 310.9	17 441.6	10 566.5	16 739.1	78 058.1
Deliveries(a)	31 768.8	16 888.8	9 440.7	15 941.4	74 039.7
Closing stock	2 607.1	1 123.1	1 696.0	1 611.7	7 037.9

(a) Includes miners' household coal and colliery consumption. (b) 53-week year

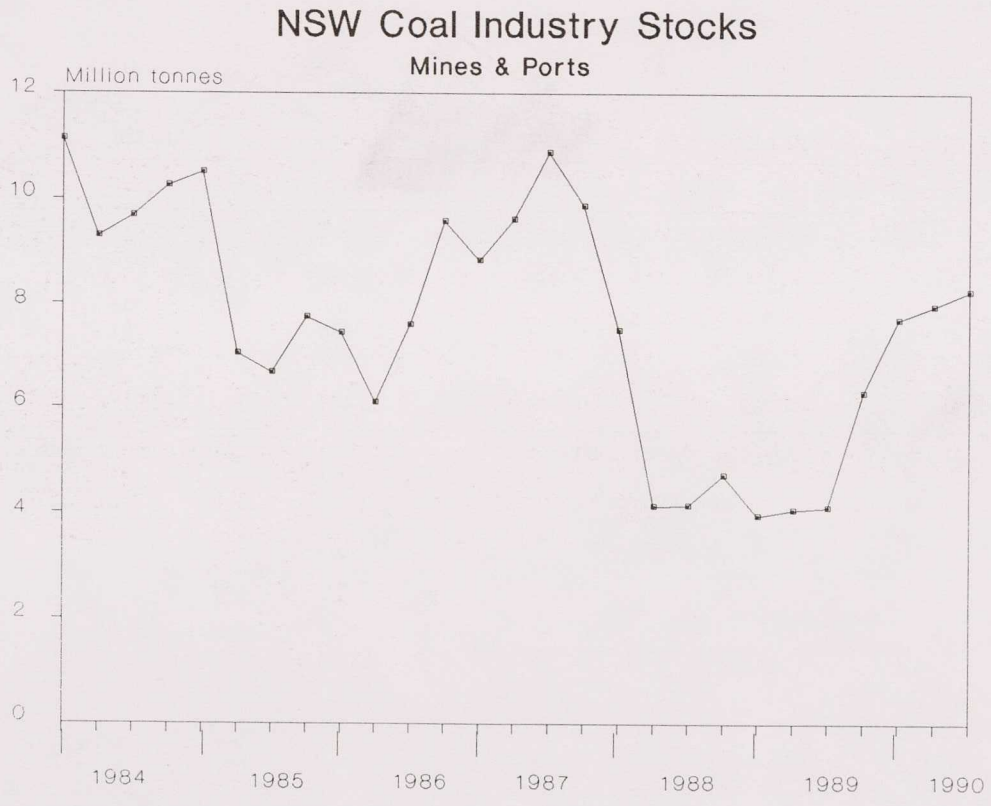
Table 3 – DELIVERIES FROM NSW COAL MINES
('000 tonnes)

Destination	Singleton-North West	Newcastle	West	South	NSW
			1988-89(c)		
Steel industry (a)	115	839	17	7 058	8 029
Coke works (other)	–	–	–	320	320
Power stations	8 093	9 171	1 755	295	19 314
Cement works	–	–	165	267	432
Other domestic consumers	121	121	342	102	686
Direct to ports for export	19 120	5 086	8 366	6 664	39 236
Total deliveries (b)	**27 449**	**15 217**	**10 645**	**14 706**	**68 017**
			1989-90		
Steel industry (a)	119	971	2	7 545	8 637
Coke works (other)	–	–	–	316	316
Power stations	10 271	9 938	1 798	–	22 007
Cement works	–	–	166	246	412
Other domestic consumers	117	103	336	81	637
Direct to ports for export	21 262	5 877	7 139	7 753	42 031
Total deliveries (b)	**31 769**	**16 889**	**9 441**	**15 941**	**74 040**

(a) Total intake of coal by the iron and steel industry. Some of this coal, after washing and blending, was shipped overseas or supplied to other local consumers.
(b) Includes miners' household coal and colliery consumption.
(c) 53-week year.

Table 4 – COAL INDUSTRY STOCKS, NSW
('000 tonnes)

	Mine Stocks						
	Singleton-North West	Newcastle	West	South	Total Mines	Port Stocks	Total Industry Stocks
At June:							
1980	1 360	401	908	823	3 492	589	4 081
1981	1 566	819	1 297	1 186	4 868	1 071	5 939
1982	1 838	1 139	1 274	2 546	6 797	992	7 789
1983	1 695	1 529	1 865	3 704	8 793	1 012	9 805
1984	2 213	1 521	1 391	3 532	8 657	1 021	9 678
1985	1 709	945	1 038	1 887	5 579	1 089	6 668
1986	2 610	1 428	1 041	1 403	6 482	1 111	7 593
1987	3 713	2 056	1 771	1 713	9 253	1 632	10 885
1988	1 487	313	416	644	2 860	1 283	4 143
1989	1 065	570	570	814	3 019	1 088	4 107
1990	2 607	1 123	1 696	1 612	7 038	1 201	8 239
1987:							
March	3 163	1 664	1 498	1 480	7 805	1 817	9 622
June	3 713	2 056	1 771	1 713	9 253	1 632	10 885
Sept	3 305	1 744	1 345	2 007	8 401	1 481	9 882
Dec	2 351	1 191	1 008	1 567	6 117	1 369	7 486
1988:							
March	1 625	580	516	538	3 259	867	4 126
June	1 487	313	416	644	2 860	1 283	4 143
Sept	1 558	432	480	774	3 244	1 462	4 706
Dec	1 273	479	607	613	2 972	969	3 941
1989:							
March	1 518	420	508	598	3 044	1 006	4 050
June	1 065	570	570	814	3 019	1 088	4 107
Sept	1 772	869	857	1 389	4 887	1 402	6 289
Dec	2 856	971	1 431	1 112	6 370	1 322	7 692
1990:							
March	2 644	1 000	1 724	1 392	6 760	1 192	7 952
June	2 607	1 123	1 696	1 612	7 038	1 201	8 239



SUMMARY STATISTICS

Coal stacking area, KCL coal loader

Table 5 – SUMMARY COAL STATISTICS, NEW SOUTH WALES

	1980-81	1985-86	1986-87	1987-88	1988-89(a)	1989-90
Production, '000t						
– Raw Coal	**58 292**	**77 186**	**88 507**	**76 268**	**81 272**	**93 893**
Underground mines	43 257	44 918	51 844	44 324	45 597	51 048
Open cuts	15 035	32 268	36 663	31 944	35 675	42 845
– Saleable Coal	**49 480**	**64 081**	**73 312**	**63 945**	**68 176**	**78 058**
Underground mines	37 123	39 607	45 389	39 025	40 830	45 187
Open cuts	12 357	24 474	27 923	24 920	27 346	32 871
Value of output, $m (b)	**1 304.9**	**2 299.6**	**2 611.7**	**2 141.4**	**2 559.6**	**n.a.**
Ave. Mine Price, $/t (b)	**26.42**	**35.89**	**35.62**	**33.49**	**37.54**	**n.a.**
Number of mines (c)	**88**	**86**	**78**	**68**	**68**	**70**
Underground	74	66	60	52	51	53
Open cut	14	20	18	16	17	17
Employment (c)	**19 867**	**19 820**	**19 548**	**16 688**	**17 178**	**17 313**
Underground mines	18 012	15 469	15 152	12 587	12 626	12 372
Open cuts	1 855	4 351	4 396	4 101	4 552	4 941
Saleable Output per Employee, t	**2 660**	**3 310**	**3 680**	**3 600**	**4 060**	**4 530**
Underground mines	2 180	2 600	2 930	2 860	3 260	3 660
Open cuts	7 820	5 930	6 300	6 050	6 390	6 750
Exports, '000t	**23 712**	**39 087**	**42 189**	**43 778**	**40 274**	**42 746**
Metallurgical	14 268	14 581	15 468	16 427	16 435	18 027
Steaming	9 444	24 506	26 721	27 351	23 839	24 718
Value of exports, $m	**910.8**	**2 084.3**	**2 157.4**	**1 876.0**	**1 820.7**	**2 294.8**
Domestic sales, '000t	**24 051**	**24 131**	**27 874**	**26 849**	**27 923**	**31 341**
Power stations	13 802	16 345	19 985	19 614	19 314	22 007
Steel Industry	8 685	6 498	6 491	5 826	7 171	7 969
Others	1 564	1 288	1 398	1 409	1 438	1 365
Mine stocks, '000t (c)	**4 688**	**6 482**	**9 253**	**2 860**	**3 019**	**7 038**

(a) 53-week year (b) Pit top value (c) End of year

Shiploading, KCL coal loader

Table 6 – SUMMARY COAL STATISTICS, SINGLETON-NORTH WEST DISTRICT

	1980-81	1985-86	1986-87	1987-88	1988-89(a)	1989-90
Production, '000t						
– Raw Coal	**18 649**	**30 182**	**36 406**	**31 445**	**33 334**	**41 460**
Underground mines	5 192	5 327	7 311	5 164	4 544	4 848
Open cuts	13 457	24 855	29 095	26 281	28 790	36 612
– Saleable Coal	**15 114**	**24 028**	**29 187**	**25 597**	**27 027**	**33 311**
Underground mines	3 688	4 096	5 819	4 180	3 714	3 980
Open cuts	11 426	19 932	23 368	21 417	23 313	29 331
Value of output, $m (b)	**n.a.**	**n.a.**	**985.1**	**878.9**	**1050.7**	**n.a.**
Ave. Mine Price, $/t (b)	**n.a.**	**n.a.**	**33.75**	**34.34**	**38.88**	**n.a.**
Number of mines (c)	**21**	**27**	**25**	**22**	**23**	**23**
Underground	11	12	11	9	9	9
Open cut	10	15	14	13	14	14
Employment (c)	**3 281**	**5 903**	**6 064**	**5 396**	**5 625**	**5 922**
Underground mines	1 640	1 949	2 048	1 620	1 475	1 381
Open cuts	1 641	3 954	4 016	3 776	4 150	4 541
Saleable Output per Employee, t	**5 090**	**4 290**	**4 790**	**4 670**	**4 900**	**5 690**
Underground mines	2 370	2 160	2 850	2 460	2 320	2 870
Open cuts	8 070	5 380	5 770	5 660	5 950	6 560
Exports, '000t	**9 144**	**17 158**	**19 066**	**18 739**	**19 278**	**21 363**
Metallurgical	n.a.	6 702	7 366	7 442	8 175	8 924
Steaming	n.a.	10 456	11 701	11 298	11 102	12 439
Value of exports, $m	**n.a.**	**903.3**	**974.4**	**805.9**	**849.7**	**1 131.5**
Domestic sales, '000t	**5 657**	**6 082**	**8 745**	**9 026**	**8 329**	**10 507**
Power stations	5 440	5 917	8 547	8 867	8 093	10 271
Steel Industry	134	54	62	50	115	119
Others	83	111	136	109	121	117
Mine stocks, '000t (c)	**1 566**	**2 610**	**3 713**	**1 487**	**1 065**	**2 607**

(a) 53-week year (b) Pit top value (c) End of year

Dragline, Howick mine

Table 7 – SUMMARY COAL STATISTICS, NEWCASTLE DISTRICT

	1980-81	1985-86	1986-87	1987-88	1988-89(a)	1989-90
Production, '000t						
– Raw Coal	**15 519**	**17 918**	**21 191**	**17 418**	**17 702**	**20 203**
Underground mines	14 021	16 684	19 771	16 108	16 327	18 570
Open cuts	1 498	1 234	1 420	1 310	1 375	1 633
– Saleable Coal	**13 577**	**15 700**	**18 227**	**15 032**	**15 474**	**17 442**
Underground mines	12 722	14 889	17 329	14 234	14 648	16 465
Open cuts	855	811	898	799	826	977
Value of output, $m (b)	**n.a.**	**n.a.**	**682.3**	**461.1**	**578.4**	**n.a.**
Ave. Mine Price, $/t (b)	**n.a.**	**n.a.**	**37.43**	**30.67**	**37.38**	**n.a.**
Number of mines (c)	**26**	**24**	**24**	**19**	**18**	**18**
Underground	24	21	22	18	17	17
Open cut	2	3	2	1	1	1
Employment (c)	**6 907**	**6 596**	**6 570**	**5 116**	**5 006**	**4 952**
Underground mines	6 749	6 450	6 442	5 040	4 924	4 871
Open cuts	158	146	128	76	82	81
Saleable Output per Employee, t	**2 130**	**2 390**	**2 760**	**2 570**	**3 090**	**3 510**
Underground mines	2 050	2 330	2 680	2 470	2 970	3 370
Open cuts	5 660	4 800	6 910	9 860	10 460	11 620
Exports, '000t	**4 514**	**5 848**	**6 731**	**6 707**	**5 107**	**5 804**
Metallurgical	n.a.	2 292	2 509	2 550	2 491	2 896
Steaming	n.a.	3 556	4 222	4 158	2 615	2 909
Value of exports, $m	**n.a.**	**310.5**	**334.7**	**279.6**	**231.4**	**310.6**
Domestic sales, '000t	**8 565**	**9 324**	**10 835**	**10 020**	**10 131**	**11 012**
Power stations	5 926	8 226	9 431	8 913	9 171	9 938
Steel Industry	2 388	997	1 272	1 012	839	971
Others	251	101	132	95	121	103
Mine stocks, '000t (c)	**819**	**1 428**	**2 056**	**313**	**570**	**1 123**

(a) 53-week year (b) Pit top value (c) End of year

Workmen repairing miner picks, Myuna colliery

Table 8 – SUMMARY COAL STATISTICS, WEST DISTRICT

	1980-81	1985-86	1986-87	1987-88	1988-89(a)	1989-90
Production, '000t						
– Raw Coal	**6 320**	**13 743**	**14 373**	**12 133**	**13 606**	**13 285**
Underground mines	6 240	7 564	8 225	7 780	8 096	8 685
Open cuts	80	6 179	6 148	4 353	5 510	4 600
– Saleable Coal	**6 104**	**10 775**	**11 029**	**10 001**	**10 799**	**10 566**
Underground mines	6 028	7 044	7 373	7 297	7 592	8 003
Open cuts	76	3 731	3 656	2 704	3 207	2 563
Value of output, $m (b)	**130.3**	**292.2**	**322.5**	**267.5**	**350.7**	**n.a.**
Ave. Mine Price, $/t (b)	**21.36**	**27.12**	**29.24**	**26.75**	**32.48**	**n.a.**
Number of mines (c)	**15**	**15**	**12**	**11**	**11**	**12**
Underground	13	13	10	9	9	10
Open cut	2	2	2	2	2	2
Employment (c)	**1 669**	**2 179**	**1 955**	**1 602**	**1 816**	**1 862**
Underground mines	1 613	1 928	1 703	1 353	1 496	1 543
Open cuts	56	251	252	249	320	319
Saleable Output per Employee, t	**4 240**	**5 200**	**5 230**	**5 670**	**6 410**	**5 730**
Underground mines	4 230	3 860	3 970	4 820	5 420	5 240
Open cuts	5 410	15 110	14 620	10 860	11 330	8 110
Exports, '000t	**3 351**	**8 467**	**8 100**	**9 504**	**8 434**	**7 125**
Metallurgical	n.a.	397	658	846	701	499
Steaming	n.a.	8 070	7 442	8 658	7 733	6 626
Value of exports, $m	**n.a.**	**396.3**	**369.3**	**371.1**	**363.6**	**355.7**
Domestic sales, '000t	**2 293**	**2 333**	**1 985**	**2 124**	**2 279**	**2 302**
Power stations	1 752	1 800	1 475	1 601	1 755	1 798
Steel Industry	0	–	–	–	17	2
Others	541	533	510	523	507	502
Mine stocks, '000t (c)	**1 186**	**1 041**	**1 771**	**416**	**570**	**1 696**

(a) 53-week year (b) Pit top value (c) End of year

Shovel, in-pit crusher and conveyor, Ulan mine

Table 9 – SUMMARY COAL STATISTICS, SOUTH DISTRICT

	1980-81	1985-86	1986-87	1987-88	1988-89(a)	1989-90
Production, '000t						
– Raw Coal	**17 804**	**15 343**	**16 537**	**15 272**	**16 630**	**18 945**
Underground mines	17 804	15 343	16 537	15 272	16 630	18 945
Open cuts	–	–	–	–	–	–
– Saleable Coal	**14 685**	**13 578**	**14 869**	**13 314**	**14 876**	**16 739**
Underground mines	14 685	13 578	14 869	13 314	14 876	16 739
Open cuts	–	–	–	–	–	–
Value of output, $m (b)	**534.6**	**623.9**	**621.9**	**533.9**	**579.8**	**n.a.**
Ave. Mine Price, $/t (b)	**36.44**	**45.95**	**41.83**	**40.10**	**38.98**	**n.a.**
Number of mines (c)	**26**	**20**	**17**	**16**	**16**	**17**
Underground	26	20	17	16	16	17
Open cut	–	–	–	–	–	–
Employment (c)	**8 010**	**5 142**	**4 959**	**4 574**	**4 731**	**4 577**
Underground mines	8 010	5 142	4 959	4 574	4 731	4 577
Open cuts	–	–	–	–	–	–
Saleable Output per Employee, t	**1 870**	**2 660**	**2 910**	**2 850**	**3 240**	**3 680**
Underground mines	1 870	2 660	2 910	2 850	3 240	3 680
Open cuts	–	–	–	–	–	–
Exports, '000t	**6 703**	**7 614**	**8 291**	**8 827**	**7 456**	**8 454**
Metallurgical	n.a.	5 191	4 936	5 589	5 068	5 708
Steaming	n.a.	2 424	3 355	3 237	2 388	2 745
Value of exports, $m	**n.a.**	**474.1**	**478.9**	**419.5**	**375.0**	**497.1**
Domestic sales, '000t	**7 536**	**6 392**	**6 309**	**5 679**	**7 184**	**7 520**
Power stations	684	402	532	233	295	–
Steel Industry	6 163	5 447	5 157	4 764	6 200	6 877
Others	689	543	620	682	689	643
Mine stocks, '000t (c)	**1 186**	**1 403**	**1 713**	**644**	**814**	**1 612**

(a) 53-week year (b) Pit top value (c) End of year

Longwall mining, South Bulli Colliery

RESOURCES

Coal seam development, Mount Arthur area

COAL RESOURCE BASE

Bituminous coal resources of approximately 80 billion tonnes in-situ have been identified in New South Wales. This is based on an assessment undertaken jointly by the NSW Department of Minerals and Energy and the Joint Coal Board over the period 1984 to 1986. The results were published by the Department in *New South Wales Coal Resources and Reserves 1986*. This updates the previous assessment published by the Board in 1979.

Resources are defined as coal with an in-situ ash of less than 35 per cent, at depths not greater than 600 metres and where exploration has established continuity between observation points. Of the 80 billion tonnes resource base, 33 billion tonnes are classified as 'measured plus indicated' and 47 billion tonnes as 'assumed plus inferred'. Measured and indicated resources are calculated from borehole spacings no greater than 2km apart. The calculations reflect a high confidence level. Calculations of assumed and inferred resources are based on less definitive borehole information and as a result the assessment of these resources is less reliable.

Most of the State's coal resources are to be found in the Sydney-Gunnedah basin. Within this basin, five coalfields are identified – Gunnedah, Hunter, Newcastle, Western and Southern. These coalfields are located close to deepwater ports at Newcastle, Sydney and Port Kembla, and offer a broad variety of coals. Other smaller coal provinces include the Ashford, Gloucester and Oaklands basins.

NSW COAL RESOURCE BASE
million tonnes in-situ

Coalfield	Measured & indicated	Assumed & inferred	Total resource
Gunnedah	2 150	29 860	32 010
Hunter	19 018	3 630	22 648
Newcastle	4 681	3 310	7 991
Western	2 630	1 710	4 340
Southern	3 426	4 790	8 216
Other areas	1 531	3 320	4 851
NSW	**33 436**	**46 620**	**80 056**

Almost 60 per cent of measured and indicated resources are located in the Hunter coalfield, the principal coal producing area of the State. Most of the assumed and inferred resources are located in the Gunnedah coalfield where relatively little mining has been carried out to date.

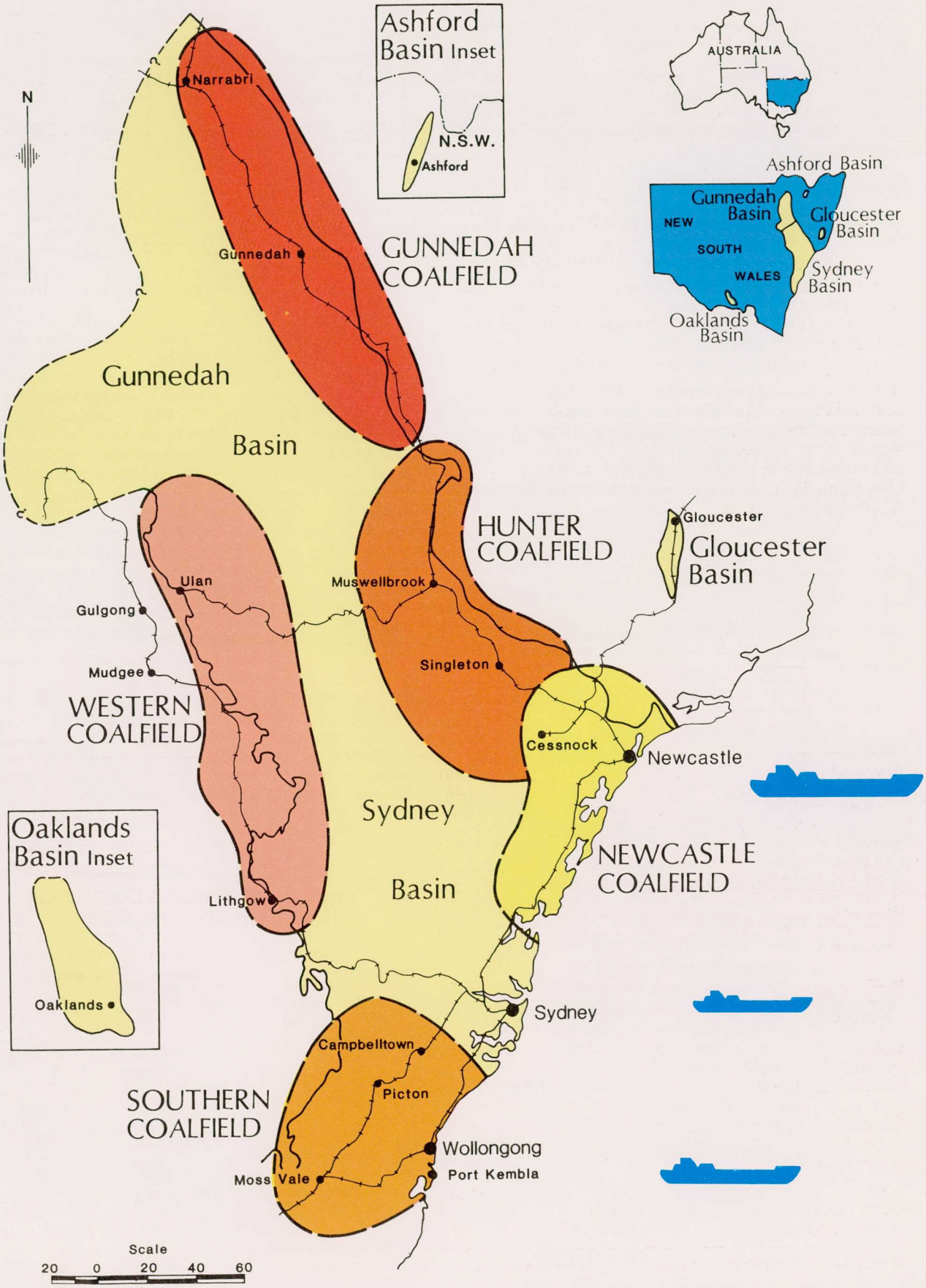
About 15 billion tonnes of the identified coal resource base has open cut mining potential based on criteria of seam thickness greater than 0.3 metres, linear overburden to coal ratio less than 10:1 to a depth of 300 metres. A further 37 billion tonnes to 300 metres depth and 28 billion tonnes between 300 and 600 metres are categorised as mineable by underground methods based on a seam thickness of greater than 1.5 metres.

Table 10 – NSW COAL RESOURCES BY MINING METHOD/DEPTH
(million tonnes in-situ)

		Underground			
	Open cut	<300m	300-600m	Total	Total resource
Gunnedah	**894**	**15 791**	**15 325**	**31 116**	**32 010**
Measured & indicated	544	1 481	125	1 606	2 150
Assumed & inferred	350	14 310	15 200	29 510	29 860
Hunter	**11 417**	**7 951**	**3 280**	**11 231**	**22 648**
Measured & indicated	10 947	5 801	2 270	8 071	19 018
Assumed & inferred	470	2 150	1 010	3 160	3 630
Newcastle	**369**	**5 739**	**1 883**	**7 622**	**7 991**
Measured & indicated	209	4 019	453	4 472	4 681
Assumed & inferred	160	1 720	1 430	3 150	3 310
West	**1 137**	**2 808**	**395**	**3 203**	**4 340**
Measured & indicated	737	1 558	335	1 893	2 630
Assumed & inferred	400	1 250	60	1 310	1 710
South	**–**	**1 065**	**7 151**	**8 216**	**8 216**
Measured & indicated	–	825	2 601	3 426	3 426
Assumed & inferred	–	240	4 550	4 790	4 790
Other Areas	**1 522**	**3 329**	**–**	**3 329**	**4 851**
Measured & indicated	1 492	39	–	39	1 531
Assumed & inferred	30	3 290	–	3 290	3 320
Total	**15 339**	**36 683**	**28 034**	**64 717**	**80 056**
Measured & indicated	13 929	13 723	5 784	19 507	33 436
Assumed & inferred	1 410	22 960	22 250	45 210	46 620

Source: New South Wales Coal Resources and Reserves 1986, Department of Minerals and Energy

COALFIELDS OF NEW SOUTH WALES



By courtesy of Department of Minerals and Energy

COAL QUALITY

All the commercial coals of NSW are higher rank or bituminous in nature (see Australian Standard 2096-1987 Classification and Coding Systems for Australian Coals). The vast majority are high-volatile bituminous, with low-volatile bituminous coals restricted to the Southern coalfield and medium-volatile bituminous coals to the Southern and Western fields.

The ash level as mined is variable and is high in some cases, but it can usually be reduced to low to medium levels by suitable coal preparation. Sulphur content is low by world standards for all but a few of the commercial coals produced.

Coking quality is variable, being dependent on seam characteristics, location and the ash level. Good coking coals are produced from all the coalfields except the Western. Some Western coals are suitable as blend components in coking under suitable conditions.

Steaming coals are produced from all the coalfields. The export products are of high quality, with high specific energy (dependent on rank and ash level), high ash fusibility, good grindability characteristics and generally low contents of sulphur and deleterious trace elements.

The coal quality from the different coalfields is discussed in more detail below. Abbreviations used in tables of indicative coal properties are:

ar	as received basis
ad	air dry basis
TM	total moisture
IM	inherent moisture
VM	volatile matter
CSN	crucible swelling number
TS	total sulphur
Cl	chlorine
P	phosphorous
R_V	mean maximum reflectance of vitrinite
GK	Gray King
GSE	gross specific energy
ADT	ash deformation temperature
AFT	ash flow temperature
HGI	Hardgrove grindability index
N/A	not applicable

Gunnedah Coalfield

The coals of this field are all high-volatile bituminous in rank. The Hoskisson and Melville seams are mined from the upper (Black Jack) coal measures. The coals are relatively low in ash and sulphur and very low in phosphorous. The specific energy is high and the ash fusion characteristics generally good. The Melville seam has the better coking and swelling properties.

Currently the only seam being mined from the lower (Greta) coal measures is the Gundawarra, although a number of others have been investigated. These seams have low ash as mined and could be prepared down to very low ash levels. Sulphur and phosphorous are also very low. The specific energy is high and ash fusion characteristics somewhat variable. The Gundawarra seam is non-coking, but some of the other seams have potential for use in coking blends.

Indicative coal properties for the Gunnedah coalfield are given in Table 11.

Hunter Coalfield

The coals of the Hunter coalfield are normally high-volatile bituminous in rank, although heat-affected coal is mined in some areas as low-volatile. The field contains the greatest concentration of coal resources in NSW, mined in a number of areas by large scale multi-seam operations. The commercial coals can be divided into two groups:

(i) those from the upper (Singleton) coal measures, consisting of approximately 20 seams, currently worked by 13 mines, and

(ii) those from the lower (Greta) coal measures, consisting of approximately 10 seams, worked by five mines.

Indicative properties of the Hunter coalfield are given in Table 12. Coals from the upper coal measures are multi-purpose in nature, providing low-ash high-quality soft and semi-soft coking coals, low-ash export steaming coals and high-ash steaming coals for local power station fuel. The sulphur content is usually low, while other properties are variable.

The main seams mined, in general sequence order, are the Whybrow, Redbank Creek, Wambo, Whynot, Blakefield, Glen Munro, Woodlands Hill, Bowfield, Warkworth, Mount Arthur, Piercefield, Vaux, Ravensworth, Bayswater, Pikes Gully, Arties, Liddell and Barrett. Many of these occur in a number of splits which vary in number and thickness from place to place. Their properties also vary. The Ravensworth and Bayswater seams are generally different in that they have a high content of inherent mineral matter. This makes it impractical to wash them down to export ash levels. They also contain a high content of inertinite in the coal substance. Their use is therefore limited to local power stations. All the other seams provide export coals. The quality of these products ranges from low ash, high-fluidity soft coking coals to medium-ash steaming coals.

The lower coal measures provide essentially steaming coals with some semi-soft coking coals. In general, the sulphur and phosphorus contents are higher than in the upper measures. The ash varies from low for the prime export coals to high for local power station use. Other properties are somewhat variable. The principal seams mined, in general sequence order, are the Brougham, Grasstrees, Thiess, Puxtrees, Balmoral, Fleming, Hallett, Muswellbrook, St Heliers and Lewis.

Table 11 – GUNNEDAH COALFIELD, INDICATIVE COAL PROPERTIES

Property	Export coking	Export steaming
TM % (ar)	9.5	9.5
IM % (ad)	2.5-3.5	2.5-3.5
Ash % (ad)	7.0-9.5	10.0-14.0
VM % (ad)	34.5-37.5	31.0-32.5
CSN	3-6	1-2
TS % (ad)	0.45-0.75	0.40-0.75
Cl % (ad)	0.01	0.01-0.02
P % (ad)	0.005-0.05	0.005-0.015
R_V max. (%)	0.65-0.68	N/A
GK coke type	C-G1	N/A
Max. fluidity (ddpm)	35-1500	N/A
Max. dilatation (%)	-30 to +10	N/A
GSE MJ/kg (ad)	30.0-31.0	27.5-30.0
kca sl/kg (ad)	7150-7400	6500-7150
ADT (°C)	N/A	1250-1500
AFT (°C)	N/A	1350->1600
HGI	N/A	45-50

Table 12 – HUNTER COALFIELD, INDICATIVE COAL PROPERTIES

Property	Upper Measures			
	Soft coking	Semi-soft coking	Export steaming	Domestic steaming
TM % (ar)	8-10	8-10	9-10	8-10
IM % (ad)	2-3	2-4	2-4	2-4
Ash % (ad)	7-9.5	9-10	12-17	22-30
VM % (ad)	32-36	32-37	29-34	23-34
CSN	4-6	3-4	1-3	0-4
TS % (ad)	0.3-0.7	0.3-0.9	0.3-0.7	0.4-0.6
Cl % (ad)	0-0.2	0-0.2	0-0.2	0-0.2
P % (ad)	0.003-0.07	0.01-0.035	0.007-0.04	0.01-0.05
R_V max. (%)	0.67-0.78	0.67-0.77	N/A	N/A
GK coke type	G-G6	E-G2	N/A	N/A
Max. fluidity (ddpm)	10-1000	10-400	N/A	N/A
Max. dilatation (%)	–30 to +60	–30 to –10	N/A	N/A
GSE MJ/kg (ad)	28-31	29-31	27-29	20-24
kcal/kg (ad)	6700-7400	6950-7400	6450-6950	4800-5750
ADT (°C)	N/A	N/A	1200->1560	1250->1560
AFT (°C)	N/A	N/A	1400->1560	1300->1560
HGI	N/A	N/A	48-55	44-55

Property	Lower Measures			
	Semi-soft coking	Low volatile coal	Export steaming	Domestic steaming
TM % (ar)	9-10	13-16	9-10	8-10
IM % (ad)	2-3	3	2-4	2-4
Ash % (ad)	8.5-9.5	12-25	9.5-15	18-22
VM % (ad)	33-36	10-14	33-36	30-33
CSN	1-2	1	1-2	1
TS % (ad)	0.8-0.9	0.6-1.0	0.8-1.0	0.8-1.0
Cl % (ad)	0.02-0.05	0.04	0.02-0.05	0.02-0.05
P % (ad)	0.05-0.06	0.01-0.1	0.05-0.06	0.06-0.08
R_V max. (%)	0.62-0.69	N/A	N/A	N/A
GK coal type	D-E	N/A	N/A	N/A
Max. fluidity (ddpm)	10-20	N/A	N/A	N/A
Max. dilatation (%)	N/A	N/A	N/A	N/A
GSE MJ/kg (ad)	30-31	25-29	28-30	25-27
kcal/kg (ad)	7200-7300	6000-6950	6700-7150	5950-6450
ADT (°C)	N/A	1250	1300-1400	1300-1400
AFT (°C)	N/A	1450	1400-1500	1400-1500
HGI	N/A	45-50	45-50	45-50

Table 13 – NEWCASTLE COALFIELD, INDICATIVE COAL PROPERTIES

Property	Upper Measures					Lower Measures	
	Newcastle Stage			Tomago Stage		Greta Seam Soft coking	Tangorin Seam Blending coal
	Soft coking	Export steaming	Domestic steaming	Soft coking	Export steaming		
TM % (ar)	7-10	8-9	5-9	7	8	7	7
IM % (ad)	2-3	2.5	2-3.5	2.5	2.5	2.5	2.5
Ash % (ad)	6-11	13.5-16.5	16-26	8	15	6	15
VM % (ad)	34-36	30-34	25-28	37	32	40	43
CSN	5-7	1-2	1	6	2	6	4
TS % (ad)	0.4-0.5	0.3-0.5	0.3-0.5	0.85	1.2	0.8	5.5
Cl % (ad)	0.01-0.03	0.01-0.05	0.01-0.05	0.02	0.04-0.07	0.1	0.01
P % (ad)	0.05-0.1	0.01-0.06	0.01-0.05	0.01-0.04	0.01	0.03	0.05
$R_V$max (%)	0.8-0.9	N/A	N/A	0.8	N/A	0.7	0.5
GK coke type	G3-G7	N/A	N/A	G2	N/A	G6	G5
Max. fluidity (ddpm)	100-1500	N/A	N/A	400-800	NA	>5000	>5000
Max. dilatation (%)	+15 to +90	N/A	N/A	+20 to +40	N/A	+20	+90
GSE MJ/kg (ad)	29-30	27-29	23-27	31	28	32	28.5
kcal/kg (ad)	6950-7150	6450-6950	5500-6450	7400	6700	7650	6800
ADT (°C)	N/A	1260-1450	1240-1500	N/A	1350	1460	1250
AFT (°C)	N/A	1500->1560	1450->1560	N/A	1560	1520	1360
HGI	N/A	50-60	47-50	N/A	50	35	41

Newcastle Coalfield

The coals of the Newcastle coalfield come from two stages of the upper coal measures, the Newcastle and Tomago, and two parts of the lower (Greta) coal measures, viz south-west of Cessnock and the Cranky Corner Basin east of Singleton. All the coals are high-volatile bituminous in rank but they differ in type and detailed properties.

The seams of the Newcastle measures occur south and west of Newcastle and dip towards the south. The upper seams, e.g. Wallarah, Great Northern and Fassifern, are essentially steaming coals, often high in ash as mined but very low in sulphur. Their main use is fuel for the large power stations in the area. The lower seams, e.g. Young Wallsend, Dudley and Borehole, provide soft coking coals after suitable coal preparation. They are used in the coke ovens at the Newcastle steelworks and also exported. Currently, fifteen mines operate in the Newcastle coal measures.

Currently only two mines, south-west of Maitland, operate in the Tomago measures. Seams mined include the Whites Creek, Elwells Creek, Donaldson, Big Ben and Rathluba. A soft coking coal is produced from the Rathluba seam and a steam coal from the other seams. The sulphur content ranges from moderate (0.8%, ad) to high (1.5%, ad).

In the lower coal measures only one mine now operates in the Greta seam. The coal is now used mainly in coking blends where its low ash (6%, ad) is advantageous. Greta seam coal is perhydrous (high in hydrogen) and has advantages in coal liquefaction under suitable economic conditions. The sulphur content of the Greta seam is moderate to high (e.g. 1%, ad). It is also a very hard coal (e.g. hardgrove grindability index of 35) which makes it unsuitable for power station use.

Another mine operates in the Tangorin seam of the lower coal measures. This seam is similar to the Greta seam but it contains an extremely high sulphur content (e.g. 5.5%, ad) which is very unusual in Australia. Because of this, the coal is mainly sold for blending with low-sulphur coals to produce blends of moderate sulphur specification.

Indicative coal properties for the coal products of the Newcastle coalfield are given in Table 13.

Western Coalfield

The Western coalfield extends north from Lithgow to Ulan. The Lithgow seam is worked by eight mines between Lithgow and Kandos. The Katoomba seam is worked at one mine east of Lithgow. The Ulan seam is mined in both open cut and underground operations near Ulan.

The Lithgow and Ulan seams are high-volatile bituminous in rank, while the Katoomba seam is medium-volatile bituminous. The coals from the Western coalfield are good steaming coals with moderate ash, low to moderate sulphur content and high ash fusibility. Some low-ash products are exported for metallurgical use. Most coal from the Ulan and Katoomba seams is exported. Unwashed Lithgow seam coal is burned in a power station at Wallerawang, while washed Lithgow seam product is exported.

Indicative coal properties for the Western coalfield are summarised in Table 14.

Southern Coalfield

The Southern coalfield extends form Helensburgh to Kiama on the coast and from the Burragorang Valley to Berrima in the south-west. Three seams are mined: Bulli, Wongawilli and Tongarra. The Balgownie seam has been mined from time to time in the past. Most production comes from the Bulli seam which is currently worked by eleven mines. Six mines work the Wongawilli seam and one both the Wongawilli and Tongarra seams.

The Bulli seam provides the only low-volatile bituminous coal mined commercially in New South Wales. Although it is relatively low in vitrinite content, it is a prime hard coking coal due to a large content of reactive semi-fusinite. It has low sulphur and moderate phosphorus content and can be prepared to a moderately low ash level. The rank of the coal increases to the north and decreases to the south and west. In the Burragorang Valley and around Tahmoor it is a medium-volatile bituminous coal with excellent coking properties. Bulli seam coal is the basis of the coal blend used in the coke ovens at the Port Kembla and Whyalla steelworks and is also exported to steelmakers in Asia, Europe and South America.

The Wongawilli seam is normally medium-volatile bituminous in rank, but decreases to high-volatile bituminous in the south-west, e.g. near Berrima. It tends to have a very high content of inherent mineral matter which makes its preparation to less than 10% ash at economic yield difficult. The Wongawilli seam complements the Bulli seam very well in blends. It has a high vitrinite content and very high swelling and coking indices with especially high fluidity. It has moderately low sulphur content and very low phosphorous content.

The Bulli and Wongawilli seams when prepared at moderate ash levels make good steaming coals. The specific energy is high and the sulphur and chlorine contents are low. Phosphorus is low to moderate. Ash fusion temperatures are high. At Berrima, high-ash Wongawilli coal is used in cement manufacture. The Tongarra seam is similar to the Wongawilli in general properties, while the Balgownie resembles the Bulli but has lower phosphorus content.

Indicative coal properties for the coals of the Southern coalfield are given in Table 15.

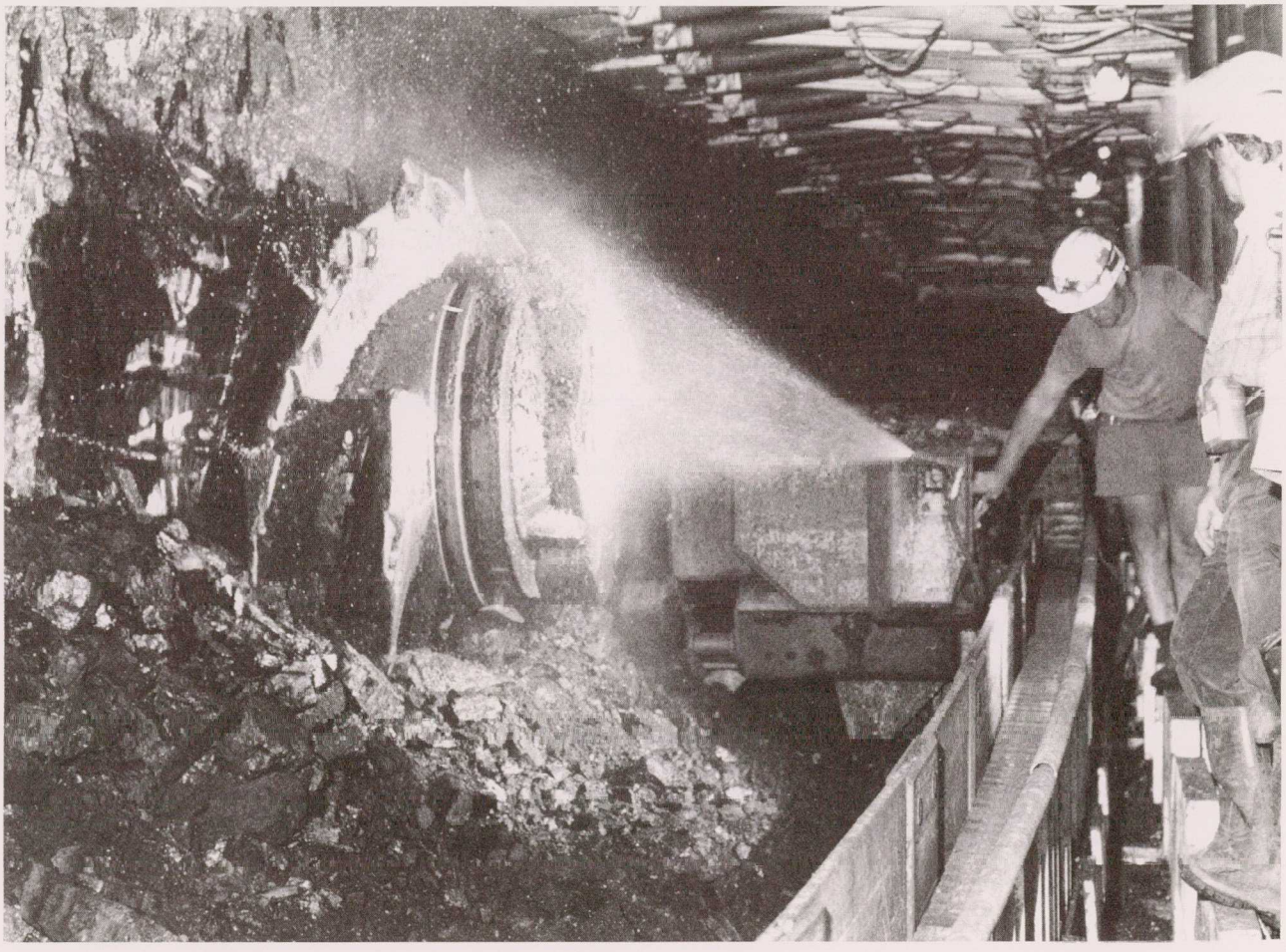
Table 14 – WESTERN COALFIELD, INDICATIVE COAL PROPERTIES

Property	Lithgow Seam			Ulan Seam	Katoomba Seam
	Semi-soft coking	Export steaming	Domestic steaming	Export steaming	Export steaming
TM % (ar)	9	9	8	9-10	8
IM % (ad)	2.5	2.5	2.5	2.5	2-2.5
Ash % (ad)	9.5	11-14	19-35	12-17	9.5-13.5
VM % (ad)	32	29-31	24-32	29-32	27-29
CSN	1-2	0.5-2	1	1-1.5	1-1.5
TS % (ad)	0.6	0.6-0.7	0.4-0.7	0.7-0.8	0.35
Cl % (ad)	0.01-0.03	0.01-0.03	0.01-0.03	0.02	0.01
P % (ad)	0.006	0.005-0.01	0.006-0.1	0.001	0.03
R_V max.(%)	0.65-0.8	N/A	N/A	N/A	N/A
GK coke type	E-F	N/A	N/A	N/A	N/A
Max. fluidity (ddpm)	10-20	N/A	N/A	N/A	N/A
Max. dilatation (%)	–30 to –15	N/A	N/A	N/A	N/A
GSE MJ/kg (ad)	30	28-29.5	20-27	27-29	29-30
kcal/kg (ad)	7150	6700-7050	4800-6950	6450-6950	6950-7150
ADT (°C)	1500	1500	1380-1500	1400	1400
AFT (°C)	>1560	>1560	>1560	>1560	>1560
HGI	45-50	45-50	40-50	50	48-50

Table 15 – SOUTHERN COALFIELD, INDICATIVE COAL PROPERTIES

Property	Bulli Seam			Wongawilli Seam		
	Coking (E area)	Coking (W area)	Steaming	Coking	Steaming	Cement
TM % (ar)	7-12	7-9	5-9	10-12	4-9	5.5
IM % (ad)	1.0	1.5	1-1.5	1-1.5	1-2	1.5
Ash % (ad)	9-10	8-9.8	12-17	9-11.5	16-27	30
VM % (ad)	20-22	27-27.5	19-26	24-27	21-30	27
CSN	4-7	3-6	0.5-3	7-9	3-7	4
TS % (ad)	0.4-0.55	0.3-0.4	0.4-0.48	0.4-0.6	0.4-0.6	0.5
Cl % (ad)	0.01-0.03	0.01-0.02	0.02-0.05	0.01-0.02	0.01-0.02	0.02
P % (ad)	0.03-0.07	0.04-0.06	0.03-0.06	0.004-0.01	0.001-0.02	0.002
R_V max.(%)	1.2-1.35	0.93-1.1	N/A	1.03-1.16	N/A	N/A
GK coke type	F-G6	F-G5	N/A	G7-G10	N/A	N/A
Max. fluidity (ddpm)	300-2000	200-4000	N/A	1000->5000	N/A	N/A
Max. dilatation (%)	+15 to +40	–25 to +90	N/A	+160 to +300	N/A	N/A
GSE MJ/kg (ad)	30-33	31-32	29-31	32	24-29.5	23
kcal/kg (ad)	7150-7900	7400-7650	6950-7400	7650	5750-7050	5500
ADT (°C)	N/A	N/A	1400->1560	1470	1260-1500	1500
AFT (°C)	N/A	N/A	>1560	>1560	1520->1560	>1560
HGI	N/A	N/A	55-75	77-80	55-75	55

PRODUCTION



Longwall mining, Ellalong colliery

PRODUCTION

Coal production statistics for NSW are presented both in terms of raw coal and saleable coal. Raw coal refers to 'as mined' or 'gross' quantities of coal extracted, i.e. it is measured prior to any subsequent treatment for removal of unwanted material (rejects) in coal washeries. Saleable coal production, also referred to as 'net' or 'marketable' production, is a combination of raw coal and washed coal as delivered to market. About 75% of NSW raw coal production is washed in coal industry washeries prior to dispatch to market. Export coal is generally washed, while most deliveries to domestic consumers are on a raw coal basis. Raw coal delivered to the Port Kembla and Newcastle steelworks is regarded as saleable product for the coal industry and no allowance is made for subsequent treatment in the steelworks' coal washeries.

Due mainly to increased export demand, NSW saleable coal production has increased from 31.08 Mt in 1970-71 to 78.06 Mt in 1989-90. Production in 1989-90 was the highest yet recorded, being 14.5% more than in the previous year and 6.5% more than the previous peak in 1986-87.

The year 1989-90 was the first full year of operation under flexible working arrangements flowing from the Coal Industry Tribunal's September 1988 restructuring decision. The resulting increase in available mine working time together with capital re-equipment at a number of mines substantially increased the productive capacity of the industry. Capacity lost from the closure of fifteen mines in 1987 and 1988 has been regained and production for the year exceeded the previous annual record by 4.75 Mt. A more settled industrial climate and improved market conditions contributed to the expansion of production for the year.

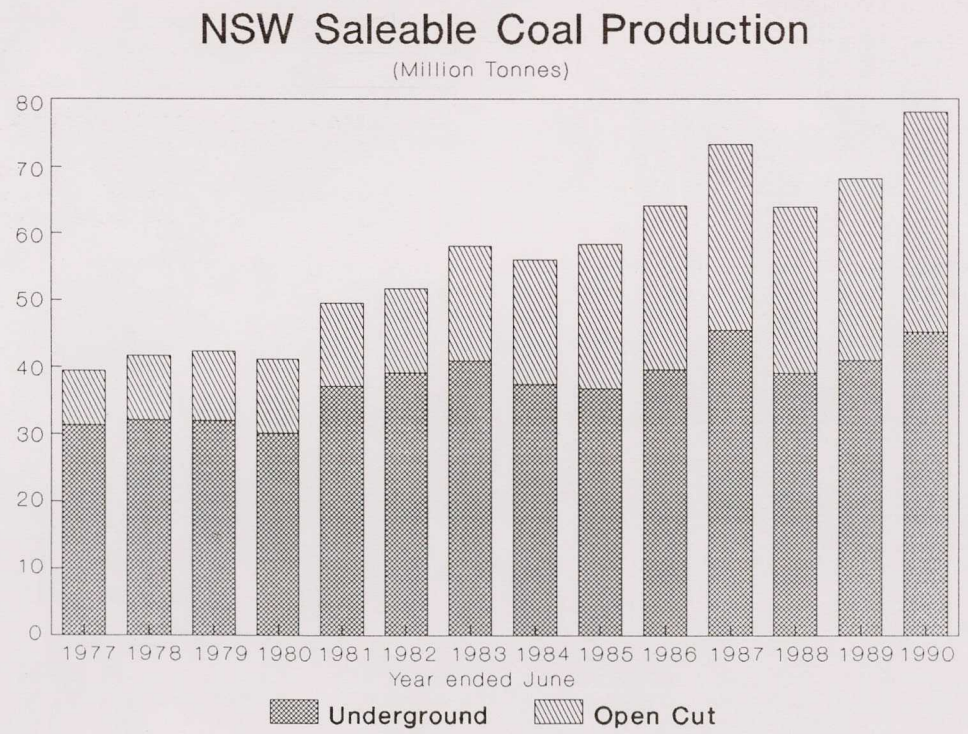
Underground mine production recovered strongly in 1989-90, increasing by 10.7% to 45.19 Mt. Production from longwall units continued to expand, rising by 16.3 per cent to 22.38 Mt raw coal. This represented 43.8 per cent of total raw coal production from underground mines. One new longwall operation was commissioned during the year at the Brimstone mine in the Burragorang Valley. At June 1990 there were 19 longwall units in operation at 18 mines.

NSW SALEABLE COAL PRODUCTION

	1988-89 (Mt)	1989-90 (Mt)
Singleton-NW	27.03	33.31
Newcastle	15.47	17.44
West	10.80	10.57
South	14.88	16.74
Total	**68.18**	**78.06**
Underground	40.83	45.19
Open Cut	27.35	32.87

Underground mining is carried out in all districts with concentration in the Newcastle and South districts. Mining is carried out under relatively shallow cover with about 70% of production won at depths less than 300 metres. The deepest mines, operating to 500 metres, are located in the hard coking coal deposits of the Southern coalfield.

Although underground mining still provides around 60% of the State's coal output, its relative importance has declined in the 1970's and 1980's with the expansion of open cut mining. Open cut operations are concentrated in the Singleton-North West and West districts where large scale, multi-seam mines have been developed to supply export markets. Saleable coal production from open cuts increased by 20.2% in 1989-90 to a record 32.87 Mt. Depth of working at open cut mines currently ranges to about 140 metres with average mine overburden to raw coal ratios ranging from 2.0 to 6.4m³/tonne.



At June 1990 there were 70 coal mines operating in NSW. The Invincible mine, which was closed in 1988, was reopened in August 1989 as a small scale operation. There were no other mine openings, or closures, during the year (the North Cliff operation, previously included with West Cliff mine, was shown as a separate mine in the Board's records from January 1990).

In recent years production of captive coal has accounted for about 25% of NSW saleable coal production. Captive coal is defined as coal used internally by the coal producing organisation and thus does not enter the 'free market'. It reflects the vertical integration into coal supplies of the Electricity Commission, steel industry (BHP) and cement companies. The Electricity Commission, a statutory body of the NSW Government, is the largest coal producer in the State. In 1989-90 its ten mines produced 11.32 Mt saleable coal. Apart from the captive mines owned by the Commission, coal production in NSW is undertaken by private enterprise through a variety of company and joint venture arrangements.

In September 1989 the State government announced plans to privatise five of the ten operating mines of the Electricity Commission. In September 1990 the Electricity Commission announced that the Liddell State mine would be offered for sale. At the same time the Commission stated that the restructuring of the other mines could not be resolved until finalisation of coal supply tenders which closed on 30 July 1990. Also in September 1990 the commission announced that it had entered into an agreement with TML Energy Co Pty Ltd for the sale of Huntley mine which ceased production in June 1989. Completion of the sale is dependent on approval being obtained for transport of the mine's output to the Port Kembla coal loader.

The 1989-90 year saw further changes in the ownership structure of the NSW coal industry. Chief among these changes were:

- BP Coal Australia sold its coal assets in NSW to CRA Ltd. These included the operating mines Howick, Vickery and Western Main (now operated by the CRA subsidiary Novacoal Australia Pty Ltd) and Tahmoor (operated by CRA subsidiary Kembla Coal & Coke Pty Ltd). CRA sold 40% of the Howick mine to the Mitsubishi Corporation. BP's 49% interest in the Clarence mine was purchased by Oakbridge Ltd.
- Bond Corporation sold its four coal mines operated by Pacific Copper Ltd (Teralba, West Wallsend, Lambton) and Barix Ltd (Great Greta) to FAI Insurances Ltd.
- A consortium led by McIlwraith McEacharn Ltd (including Toyo Menka Kaisha Ltd and Nippon Oil Co Ltd) gained control of Oakbridge Ltd from Elders Resources NZFP Ltd. By October 1990, the McIlwraith McEacharn consortium had gained over 95% of Oakbridge's shareholding. Oakbridge operates five mines (Saxonvale, Gretley, Pelton/Ellalong, Clarence and Baal Bone) and is the second largest private coal producer and exporter in NSW after Coal and Allied.
- Howard Smith Ltd sold down its shareholding in Coal & Allied Industries Ltd from 42.5% to 5.0%. The biggest shareholders in Coal & Allied, the largest coal exporter and private producer in NSW, are now the National Mutual Life Association (10%) and the Japanese companies UBE Industries (10%) and Nissho Iwai Corporation (7%).

The adjacent table lists the major NSW coal producers ranked by saleable production. There are currently some 25 producers in the industry with the top five, Electricity Commission, Coal & Allied, Oakbridge, BHP and CRA, accounting for about 60% of total production.

As compiled the list does not reflect the importance of companies such as Shell Australia Ltd and Exxon Coal and Minerals Australia Ltd. Shell has a 50.0% interest in Austen & Butta Ltd (South Bulli mine) and a 75% interest in Drayton Coal (Drayton open cut). Saleable output from these two mines amounted to 5.59 Mt in 1989-90. Exxon has a 100% interest in Lemington Coal Mines Ltd (Lemington underground and open cut) and a 36% interest in Ulan Coal Mines Ltd. Output from the Lemington and Ulan mines totalled 6.04 Mt in 1989-90.

NSW UNDERGROUND MINES, 1989-90

Raw production, Mt	51.05
— percent of total	54.4
Saleable production, Mt	45.19
— percent of total	57.9
Longwall production, Mt raw	22.38
— percent of underground	43.8
— percent of total	23.8
Number of mines, June 1990	53
— Longwall	18
— Non longwall	35
Mine size, Mt raw coal	
— average	0.96
— range	0.10-2.88
Greatest depth of working, m	500

NSW OPEN CUT MINES, 1989-90

Raw production, Mt	42.84
— percent of total	45.6
Saleable production, Mt	32.87
— percent of total	42.1
Number of mines, June 1990	17
Mine size, Mt raw coal	
— average	2.68
— range	0.13-6.41
O/B to coal ratio, m^3/t raw	
— average	3.9
— range	2.0-6.4
Depth of working, metres	12-140

MAJOR NSW COAL PRODUCERS

	No. of mines(a)	Saleable production (Mt) 1989-90(b)
Electricity Commission	10	11.32
Coal & Allied	5	11.22(c)
Oakbridge	5	8.02(c)
BHP	6	7.88
CRA	8	7.49
Ulan Coal Mines	2	4.20
Costain Aust	1	4.06
Drayton Coal	1	3.53
FAI	4	3.02

(a) Mines owned at 30 June 1990
(b) For mines owned at 30 June 1990
(c) Includes 50% of Swamp Creek

FOREIGN OWNERSHIP NSW COAL INDUSTRY

The foreign ownership statistics presented here provide a measure of the total beneficial equity interest held by foreign companies in the NSW coal mining industry. This report does not address the issue of foreign control. The determination of control is a complex and often subjective process in which many factors other than the percentage of ownership must be considered.

The data on foreign ownership is based on known foreign equity interests in NSW coal mines as at 30 September 1990. The data is presented in terms of share of saleable coal production, based on equity interest, using actual 1989-90 mine outputs. Only producing coal mines are included in the survey, it does not cover exploration areas, authorisations, non-producing coal leases or projects under development but not yet in production.

Foreign ownership accounts for 38.4% of NSW coal production. Japan has the largest share 16.6%, more than double that of three years ago, closely followed by European interests 15.2%. United States interests account for 5.3% and South Korean 1.4%.

Of the Japanese companies with interests in NSW coal mines, the largest in terms of production share is the Mitsubishi Group with equity interests in Howick Coal (40.0%), Ulan Coal Mines Ltd (49.0%) and Warkworth Associates (28.75%). Mitsubishi's share of production amounts to 3.89 Mt. The next largest following the McIlwraith McEacharn led Australian-Japanese consortium's successful bid for Oakbridge Ltd, are Toyo Menka Kaisha (2.31 Mt) and Nippon Oil (1.84 Mt). The consortium has indicated that final shareholdings of the Japanese companies in Oakbridge will be Toyo Menka 25% and Nippon Oil 23%. These have been used in this survey. Toyo Menka also recently acquired a 47.9% interest in Gunnedah Coal Co Ltd, while Nippon Oil has a 10% interest in the Bayswater joint venture.

FOREIGN OWNERSHIP NSW COAL MINES, SEPT 1990

	Production Share	
	('000 tonnes)	(%)
Japan	12 935	16.6
Europe	11 852	15.2
United States	4 137	5.3
South Korea	1 056	1.4
Total	**29 980**	**38.4**

The Sumitomo Group and Idemitsu Kosan have the biggest single shareholdings in NSW coal companies – with Wambo Mining Corporation owned 75% by Sumitomo and Muswellbrook Coal Co Ltd being 100% owned by Idemitsu.

The largest single foreign interest in the NSW coal industry in terms of production share is the UK Costain Group which, through Costain Australia Ltd, has 100% interest in Ravensworth open cut operation and a 28.75% interest in Warkworth Associates. It should be noted, however, that the Ravensworth mine is operated under contract to the Electricity Commission.

The Royal Dutch/Shell Group (through Shell Australia Ltd) and the Rio Tinto Zinc Corporation (through its 49% interest in CRA Ltd) are the other major European participants in the NSW coal industry. Shell's production share amounted to 3.67 Mt through its 50.0% interest in Austen & Butta Ltd and 74.8% interest in the Drayton joint venture. RTZ's ownership interests in NSW coal increased significantly with CRA's recent purchase of the NSW coal assets of British Petroleum to add to CRA's wholly-owned Kembla Coal & Coke operation.

Two oil companies, Caltex and Exxon, represent United States interests in the NSW coal industry. Caltex has a 55% interest in the Bayswater joint venture and Exxon has 100% of Lemington Coal Mines Ltd and a 36% interest in Ulan Coal Mines Ltd. Exxon's interests account for 3.35 Mt tonnes of saleable production. Exxon recently reduced its equity interests in the NSW coal industry by the sale of its 20% interest in United Collieries Pty Ltd to Agip (Italy).

Ownership NSW Coal Mines

Production Shares

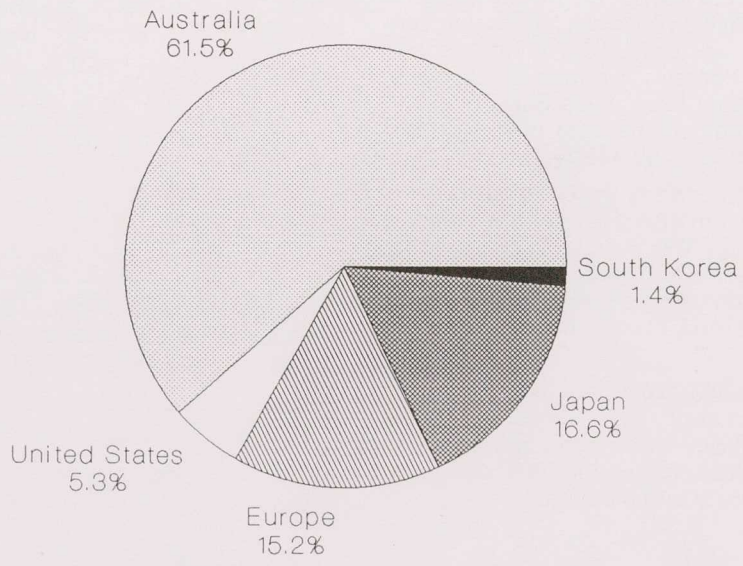


Table 16 – FOREIGN OWNERSHIP, NSW COAL INDUSTRY

Country/Company	NSW Coal Producer	Equity Interest (%)	Production Share ('000 tonnes)
Japan			
Mitsubishi Group	Howick Coal	40.0	1 129
	Ulan Coal Mines Ltd	49.0	2 059
	Warkworth Associates	28.75	706
			3 894
Toyo Menka Kaisha	Gunnedah Coal Co Ltd	47.9	459
	Oakbridge Ltd	25.0	1 846
			2 305
Nippon Oil	Bayswater Joint Venture	10.0	143
	Oakbridge Ltd	23.0	1 698
			1 841
Idemitsu Kosan	Muswellbrook Coal Co Ltd	100.0	1 394
Ube Industries	Coal and Allied Industries Ltd	10.0	1 050
Sumitomo Group	Baal Bone	20.0	319
	Wambo Mining Corp Pty Ltd	75.0	813
			1 132
Nissho Iwai	Coal and Allied Industries Ltd	7.0	735
Mitsui Group	Drayton Joint Venture	6.8	240
Nippon Steel	Warkworth Associates	7.5	184
Kyodo Oil	Clarence	10.0	160
		Japanese Total	**12 935**
Europe			
Costain	Ravensworth	100.0	4 060
	Warkworth Associates	28.75	706
			4 766
Shell	Austen and Butta Ltd	50.0	1 028
	Drayton Joint Venture	74.8	2 638
			3 666
RTZ	Kembla Coal & Coke Pty Ltd	49.0	1 938
	Novacoal Australia Pty Ltd	49.0	1 175
			3 113
Europa Minerals	Preston Coal Co Pty Ltd	50.0	172
Total	Wambo Mining Corp Pty Ltd	12.5	135
		European Total	**11 852**
United States			
Exxon	Lemington Coal Mines Ltd	100.0	1 837
	Ulan Coal Mines Ltd	36.0	1 513
			3 350
Caltex	Bayswater Joint Venture	55.0	787
		United States Total	**4 137**
South Korea			
Pohang Iron & Steel	Mount Thorley Mine	20.0	720
Yukong Ltd	Clarence Mine	10.0	160
Daesung	Drayton Joint Venture	2.5	88
Hyundai	Drayton Joint Venture	2.5	88
		South Korea Total	**1 056**

Table 17 – COAL PRODUCTION, NSW
('000 tonnes)

Year	Raw Coal			Saleable Coal		
	Underground Mines	Open Cuts	Total	Underground Mines	Open Cuts	Total
1984	42 196	26 127	68 323	36 973	20 457	57 430
1985	44 301	30 738	75 039	38 995	23 264	62 259
1986	46 775	33 535	80 310	40 955	25 457	66 412
1987	49 594	34 011	83 605	43 511	26 368	69 879
1988(a)	43 839	34 518	78 357	39 088	26 666	65 754
1989	48 389	39 286	87 675	43 008	30 133	73 141
1970-71	33 131	2 588	35 719	28 710	2 366	31 077
1971-72(a)	32 286	4 677	36 963	27 470	4 430	31 900
1972-73	32 604	5 456	38 060	28 332	4 873	33 205
1973-74	30 155	6 477	36 632	26 282	5 615	31 897
1974-75	32 957	9 349	42 306	28 296	8 018	36 314
1975-76	32 214	8 376	40 590	27 187	7 193	34 380
1976-77(a)	37 014	9 771	46 785	31 279	8 221	39 500
1977-78	37 875	11 379	49 254	32 076	9 592	41 668
1978-79	38 205	12 312	50 517	32 047	10 358	42 405
1979-80	35 362	13 348	48 710	30 073	11 144	41 217
1980-81	43 257	15 035	58 292	37 123	12 357	49 480
1981-82	44 530	15 288	59 818	39 073	12 628	51 701
1982-83(a)	46 266	21 189	67 455	40 936	17 099	58 035
1983-84	42 627	23 906	66 533	37 395	18 590	55 985
1984-85	42 058	27 976	70 034	36 660	21 593	58 253
1985-86	44 918	32 268	77 186	39 607	24 474	64 081
1986-87	51 844	36 663	88 507	45 390	27 922	73 312
1987-88	44 324	31 944	76 268	39 025	24 920	63 945
1988-89(a)	45 597	35 675	81 272	40 830	27 346	68 176
1989-90	51 048	42 845	93 893	45 187	32 871	78 058

(a) 53-week year

Table 18 – VALUE OF COAL PRODUCTION, NSW(a)

Year	Production Region			NSW
	North(b)	West	South	
	Total Value ($'000)			
1980-81	639 973	130 295	534 637	1 304 904
1981-82	763 889	189 070	584 409	1 537 367
1982-83	995 762	224 967	686 241	1 906 970
1983-84	1 039 926	203 341	490 091	1 733 358
1984-85	1 203 606	227 122	517 880	1 948 608
1985-86	1 383 445	292 243	623 903	2 299 591
1986-87	1 667 357	322 460	621 924	2 611 741
1987-88	1 340 047	267 487	533 886	2 141 420
1988-89	1 629 116	350 712	579 815	2 559 643
	Average Value per Tonne ($)			
1980-81	22.36	21.36	36.44	26.42
1981-82	25.54	24.82	40.03	29.49
1982-83	29.01	25.10	51.89	33.74
1983-84	29.60	24.54	40.17	31.16
1984-85	32.81	25.61	40.79	33.45
1985-86	34.82	27.12	45.95	35.89
1986-87	35.17	29.24	41.83	35.62
1987-88	32.98	26.75	40.10	33.49
1988-89	38.33	32.48	38.98	37.54

(a) Value at point of sale less transport cost from the mine.
(b) Newcastle and Singleton-North West districts.

Table 19 – NUMBER OF COAL MINES IN PRODUCTION, NSW

At June:	Singleton North West	Newcastle	West	South	Total	Underground	Open Cut
1970	13	36	13	28	90	79	11
1971	17	33	12	26	88	76	12
1972	15	31	11	24	81	73	8
1973	17	28	11	22	78	69	9
1974	19	28	13	22	82	71	11
1975	19	29	12	24	84	72	12
1976	19	27	12	24	82	71	11
1977	20	27	11	25	83	70	13
1978	21	27	13	25	86	73	13
1979	21	25	12	25	83	70	13
1980	19	26	12	26	83	70	13
1981	21	26	15	26	88	74	14
1982	24	28	15	24	91	72	19
1983	24	25	16	23	88	69	19
1984	24	24	16	21	85	67	18
1985	28	24	16	21	89	68	21
1986	27	24	15	20	86	66	20
1987	25	24	12	17	78	60	18
1988	22	19	11	16	68	52	16
1989	23	18	11	16	68	51	17
1990	23	18	12	17	70	53	17

Note: Mine openings and closures since December 1986 are set out below:

Mine	Company	District	Date
(i) Closures			
Ashford O/C	White Industries Ltd	Sing-NW	May 1988
Hazeldene	BP Coal Australia	Sing-NW	Oct 1987
Lemington No.2	CSR Ltd	Sing-NW	Aug 1987
Aberdare North	Coal & Allied Industries Ltd	Newcastle	Apr 1988
Benwerrin	Benwerrin Mining Pty Ltd	Newcastle	June 1987
Benwerrin O/C	Benwerrin Mining Pty Ltd	Newcastle	June 1987
Stockrington No.2	Coal & Allied Industries Ltd	Newcastle	June 1988
Wallsend Borehole No.2	Coal & Allied Industries Ltd	Newcastle	June 1988
John Darling	BHP Co Ltd	Newcastle	Nov 1987
Invincible	Austen & Butta Ltd	West	May 1988
Fernbrook	Coalex Pty Ltd	West	Dec 1986
Grose Valley	Austen & Butta Ltd	West	Mar 1987
Avon	Austen & Butta Ltd	South	June 1987
Yellow Rock	Austen & Butta Ltd	South	June 1987
Bulli	BHP Co Ltd	South	May 1987
Huntley	Huntley Colliery Pty Ltd	South	June 1989
(ii) Openings			
Avon (a)	Avon Colliery Pty Ltd	South	Oct 1988
United	United Collieries Pty Ltd	Sing-NW	June 1989
Invincible (a)	Coalpac Pty Ltd	West	Aug 1989
North Cliff (b)	Kembla Coal & Coke Pty Ltd	South	Jan 1990

(a) Re-opened
(b) Previously included with West Cliff

Table 20 – CAPTIVE COAL PRODUCTION, NSW (a)
('000 tonnes)

	1985-86	1986-87	1987-88	1988-89	1989-90
Captive productions	**16 272**	**18 124**	**16 399**	**17 829**	**19 047**
Electricity Commission (b)	9 185	10 999	10 568	10 729	11 246
Steel Industry	6 430	6 403	5 098	6 348	7 073
Cement Industry	379	421	408	432	412
Other	278	301	325	320	316
Non-captive production	**47 809**	**55 188**	**47 546**	**50 347**	**59 011**
Total Production	**64 081**	**73 312**	**63 945**	**68 176**	**78 058**
Percent captive	**25.4**	**24.7**	**25.6**	**26.2**	**24.4**

(a) Captive production is that production which is consumed by the mine owner
(b) Production by contractors to the Electricity Commission, Hebden Mining Co (Swamp Creek) and Costain Australia Ltd (Ravensworth), is shown under non-captive production.

Table 21 – PRODUCTION BY 4-WEEKLY PERIODS, 1989-90
('000 tonnes)

4 Weeks ended:	Singleton North West	Newcastle	West	South	Total	Underground mines	Open cuts
			RAW COAL				
29 July	2 673	1 605	1 094	1 459	6 831	3 997	2 834
26 August	3 302	1 881	1 177	1 698	8 058	4 637	3 421
23 September	3 356	1 796	1 054	1 746	7 952	4 464	3 488
21 October	3 447	1 639	803	1 406	7 295	3 868	3 427
18 November	3 651	1 658	1 116	1 293	7 718	3 868	3 850
16 December	3 758	1 774	1 119	1 496	8 147	4 231	3 916
13 January	2 720	1 038	796	728	5 282	2 423	2 859
10 February	2 945	1 356	1 117	1 279	6 697	3 604	3 093
10 March	3 187	1 614	898	1 641	7 340	4 165	3 175
7 April	3 088	1 782	1 262	1 731	7 863	4 511	3 352
5 May	2 713	1 099	974	1 369	6 155	3 207	2 948
2 June	3 086	1 295	786	1 640	6 807	3 956	2 851
30 June	3 534	1 666	1 089	1 459	7 748	4 116	3 632
			SALEABLE COAL				
29 July	2 218	1 406	888	1 311	5 823	3 630	2 193
26 August	2 706	1 615	868	1 501	6 690	4 068	2 622
23 September	2 720	1 558	801	1 593	6 672	3 987	2 685
21 October	2 755	1 404	638	1 220	6 017	3 386	2 631
18 November	2 924	1 408	864	1 122	6 318	3 382	2 936
16 December	3 069	1 537	949	1 285	6 840	3 715	3 125
13 January	2 183	916	595	622	4 316	2 133	2 183
10 February	2 272	1 130	875	1 176	5 453	3 218	2 235
10 March	2 498	1 392	776	1 451	6 117	3 684	2 433
7 April	2 443	1 531	975	1 549	6 498	4 022	2 476
5 May	2 275	969	759	1 187	5 190	2 818	2 372
2 June	2 399	1 118	691	1 412	5 620	3 444	2 176
30 June	2 850	1 457	888	1 310	6 505	3 699	2 806

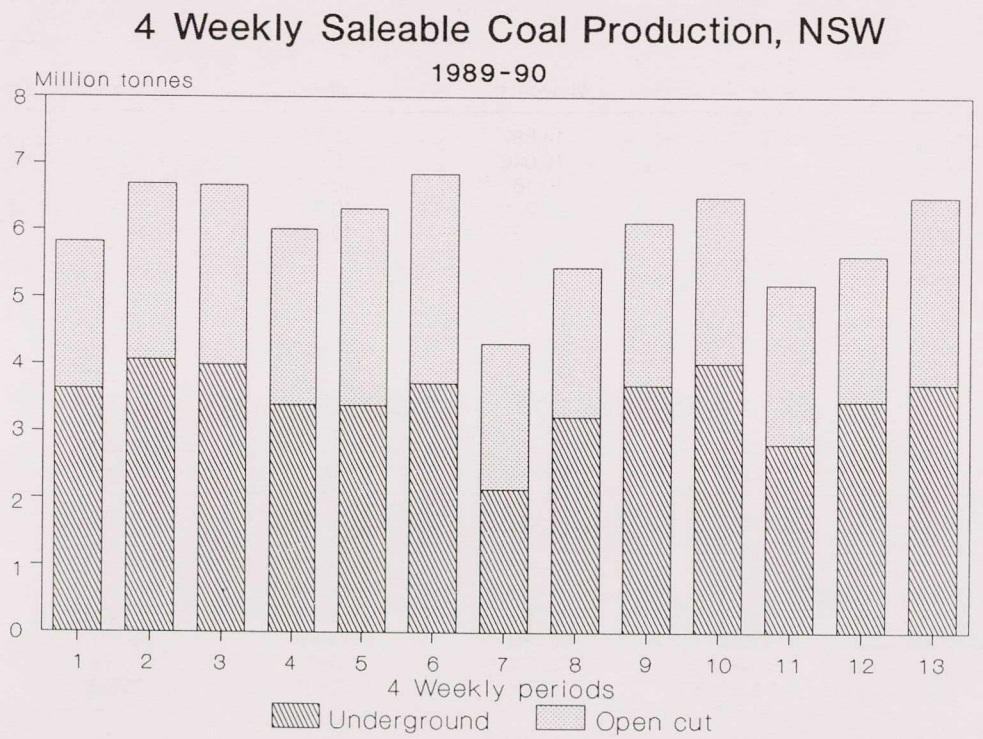


Table 22 – RAW COAL PRODUCTION BY DISTRICTS, NSW
('000 tonnes)

Year	Singleton-North West	Newcastle	West	South	Total
1984	25 943	17 197	10 521	14 662	68 323
1985	28 701	18 442	12 822	15 074	75 039
1986	32 390	18 570	13 797	15 553	80 310
1987	34 590	20 010	12 881	16 124	83 605
1988(a)	32 807	17 405	12 631	15 514	78 357
1989	36 888	19 097	13 994	17 696	87 675
1970-71	3 788	16 590	2 220	13 122	35 720
1971-72(a)	5 600	14 826	2 372	14 165	36 963
1972-73	7 173	14 750	2 028	14 109	38 060
1973-74	8 427	13 744	1 987	12 474	36 632
1974-75	11 467	14 163	2 658	14 018	42 306
1975-76	10 713	12 547	3 524	13 806	40 590
1976-77(a)	12 410	14 187	4 023	16 165	46 785
1977-78	14 023	15 000	4 128	16 103	49 254
1978-79	15 406	14 416	4 322	16 373	50 517
1979-80	16 142	13 157	4 673	14 738	48 710
1980-81	18 649	15 519	6 320	17 804	58 292
1981-82	18 482	16 266	7 767	17 303	59 818
1982-83(a)	22 780	18 709	10 062	15 905	67 456
1983-84	24 464	18 040	9 521	14 508	66 533
1984-85	26 799	17 447	11 277	14 511	70 034
1985-86	30 182	17 918	13 743	15 343	77 186
1986-87	36 406	21 191	14 373	16 537	88 507
1987-88	31 445	17 418	12 133	15 272	76 268
1988-89(a)	33 334	17 702	13 606	16 630	81 272
1989-90	41 460	20 203	13 285	18 945	93 893

(a) 53-week year

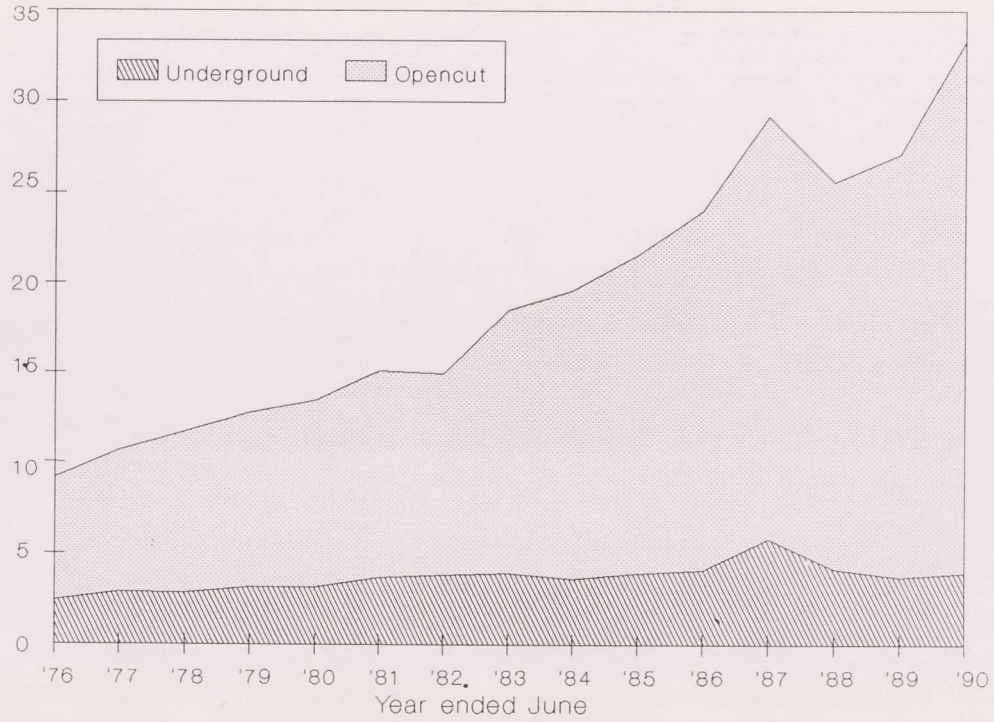
Table 23 – SALEABLE COAL PRODUCTION BY DISTRICTS, NSW
('000 tonnes)

Year	Singleton-North West	Newcastle	West	South	Total
1984	20 936	14 887	8 755	12 852	57 430
1985	22 939	16 046	9 867	13 407	62 259
1986	25 816	16 161	10 622	13 813	66 412
1987	28 062	17 232	10 336	14 249	69 879
1988(a)	26 663	15 127	10 231	13 733	65 754
1989	29 813	16 567	11 057	15 704	73 141
1970-71	3 336	14 540	1 901	11 300	31 077
1971-72(a)	4 745	13 082	2 163	11 910	31 900
1972-73	6 331	12 999	1 893	11 982	33 205
1973-74	7 221	12 080	1 865	10 731	31 897
1974-75	9 803	12 190	2 377	11 944	36 314
1975-76	9 161	10 751	3 153	11 315	34 380
1976-77(a)	10 694	12 287	3 658	12 861	39 500
1977-78	11 729	12 875	3 839	13 225	41 668
1978-79	12 792	12 392	4 026	13 195	42 405
1979-80	13 392	11 383	4 449	11 993	41 217
1980-81	15 114	13 577	6 104	14 685	49 480
1981-82	14 973	14 566	7 525	14 637	51 701
1982-83(a)	18 504	16 494	9 261	13 776	58 035
1983-84	19 611	15 412	8 255	12 707	55 985
1984-85	21 601	15 088	8 869	12 695	58 253
1985-86	24 028	15 700	10 775	13 578	64 081
1986-87	29 187	18 227	11 029	14 869	73 312
1987-88	25 597	15 033	10 001	13 314	63 945
1988-89(a)	27 027	15 474	10 799	14 876	68 176
1989-90	33 311	17 442	10 566	16 739	78 058

(a) 53-week year

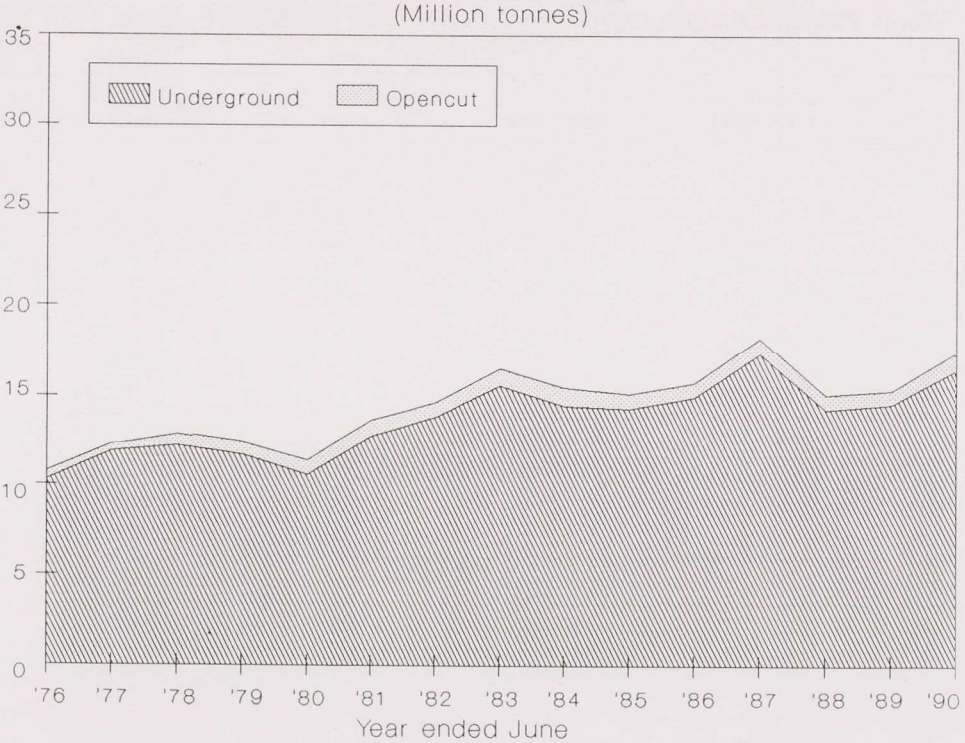
Saleable Coal Production, Singleton - NW

(Million tonnes)



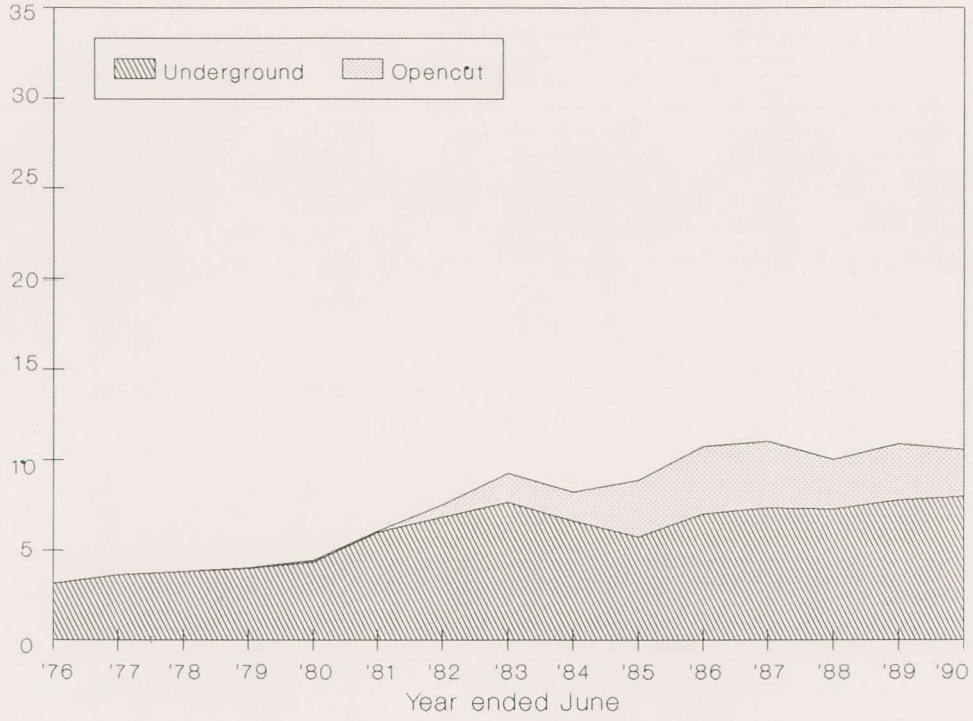
Saleable Coal Production, Newcastle

(Million tonnes)



Saleable Coal Production, West

(Million tonnes)



Saleable Coal Production, South

(Million tonnes)

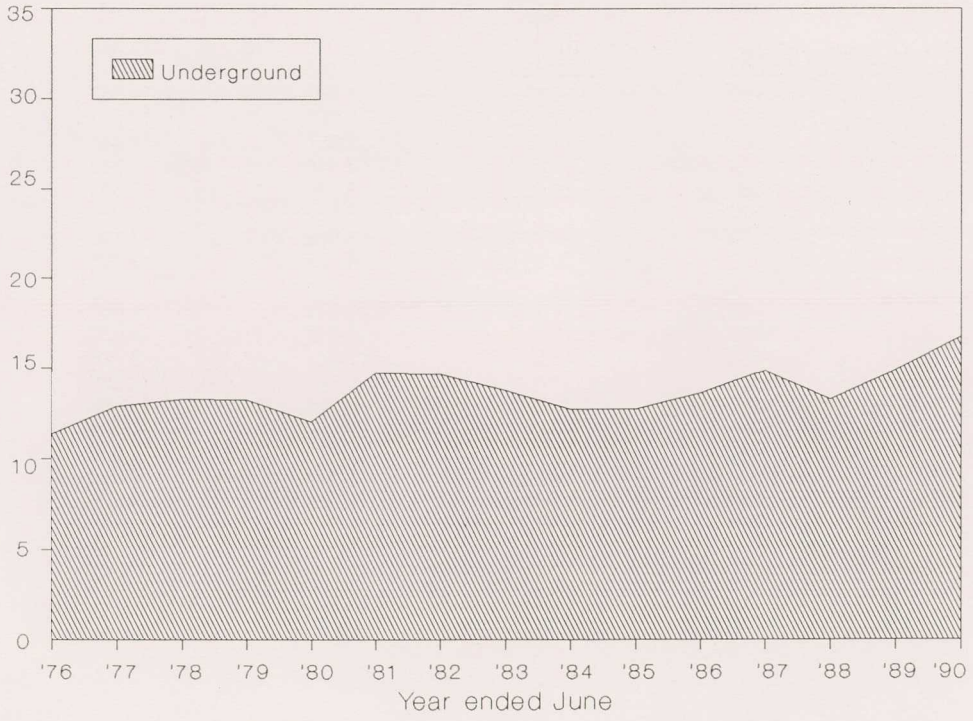


Table 24 – COAL PRODUCTION, UNDERGROUND MINES BY DISTRICTS, NSW
('000 tonnes)

Year	Singleton-North West	Newcastle	West	South	Total
		RAW COAL			
1984	5 119	15 787	6 628	14 662	42 196
1985	5 494	17 076	6 658	15 074	44 302
1986	5 947	17 335	7 940	15 553	46 775
1987	6 817	18 640	8 013	16 124	49 594
1988(a)	4 700	15 989	7 636	15 514	43 839
1989	4 503	17 581	8 609	17 696	48 389
1970-71	2 170	15 689	2 150	13 122	33 131
1971-72(a)	1 707	14 042	2 372	14 165	32 286
1972-73	2 223	14 244	2 028	14 109	32 604
1973-74	2 593	13 101	1 987	12 474	30 155
1974-75	3 102	13 193	2 645	14 017	32 957
1975-76	3 179	11 705	3 524	13 806	32 214
1976-77(a)	3 372	13 454	4 023	16 165	37 014
1977-78	3 813	13 849	4 110	16 103	37 875
1978-79	4 308	13 230	4 294	16 373	38 205
1979-80	4 242	11 790	4 592	14 738	35 362
1980-81	5 192	14 021	6 240	17 804	43 257
1981-82	5 250	14 879	7 098	17 303	44 530
1982-83(a)	5 212	17 116	8 033	15 905	46 266
1983-84	4 777	16 345	6 997	14 508	42 627
1984-85	5 227	16 147	6 173	14 511	42 058
1985-86	5 327	16 684	7 564	15 343	44 918
1986-87	7 310	19 771	8 225	16 537	51 843
1987-88	5 164	16 108	7 780	15 272	44 324
1988-89(a)	4 544	16 327	8 096	16 630	45 597
1989-90	4 848	18 570	8 685	18 945	51 048
		SALEABLE COAL			
1984	3 865	14 018	6 238	12 852	36 973
1985	4 189	15 171	6 227	13 407	38 994
1986	4 549	15 374	7 219	13 813	40 955
1987	5 586	16 363	7 313	14 249	43 511
1988(a)	3 796	14 292	7 267	13 733	39 088
1989	3 731	15 619	7 954	15 704	43 008
1970-71	1 836	13 742	1 832	11 300	28 710
1971-72(a)	1 038	12 359	2 163	11 910	27 470
1972-73	1 780	12 677	1 893	11 982	28 332
1973-74	1 994	11 692	1 865	10 731	26 282
1974-75	2 388	11 597	2 367	11 944	28 296
1975-76	2 424	10 302	3 146	11 315	27 187
1976-77(a)	2 867	11 893	3 658	12 861	31 279
1977-78	2 832	12 197	3 822	13 225	32 076
1978-79	3 133	11 721	3 998	13 195	32 047
1979-80	3 115	10 597	4 368	11 993	30 073
1980-81	3 688	12 722	6 028	14 685	37 123
1981-82	3 809	13 760	6 867	14 637	39 073
1982-83(a)	3 930	15 548	7 682	13 776	40 936
1983-84	3 622	14 408	6 659	12 706	37 395
1984-85	3 926	14 273	5 766	12 695	36 660
1985-86	4 096	14 889	7 044	13 578	39 607
1986-87	5 819	17 329	7 373	14 869	45 390
1987-88	4 180	14 234	7 297	13 314	39 025
1988-89(a)	3 714	14 648	7 592	14 876	40 830
1989-90	3 980	16 465	8 003	16 739	45 187

(a) 53 week year

Table 25 – COAL PRODUCTION, OPEN CUT MINES BY DISTRICTS, NSW
('000 tonnes)

Year	Singleton-North West	Newcastle	West	South	Total
		RAW COAL			
1984	20 824	1 410	3 893	–	26 127
1985	23 206	1 367	6 165	–	30 738
1986	26 444	1 235	5 856	–	33 535
1987	27 773	1 370	4 868	–	34 011
1988(a)	28 107	1 416	4 995	–	34 518
1989	32 385	1 516	5 385	–	39 286
1970-71	1 618	901	69	–	2 588
1971-72(a)	3 893	784	–	–	4 677
1972-73	4 950	506	–	–	5 456
1973-74	5 834	643	–	–	6 477
1974-75	8 365	970	14	–	9 349
1975-76	7 535	842	–	–	8 377
1976-77(a)	9 038	733	–	–	9 771
1977-78	10 210	1 151	18	–	11 379
1978-79	11 097	1 187	28	–	12 312
1979-80	11 900	1 367	81	–	13 348
1980-81	13 456	1 498	80	–	15 034
1981-82	13 232	1 387	669	–	15 288
1982-83(a)	17 567	1 594	2 029	–	21 190
1983-84	19 687	1 695	2 524	–	23 906
1984-85	21 572	1 300	5 104	–	27 976
1985-86	24 855	1 234	6 179	–	32 268
1986-87	29 095	1 420	6 148	–	36 663
1987-88	26 281	1 310	4 353	–	31 944
1988-89(a)	28 790	1 375	5 510	–	35 675
1989-90	36 612	1 633	4 600	–	42 845
		SALEABLE COAL			
1984	17 070	870	2 517	–	20 457
1985	18 750	875	3 639	–	23 264
1986	21 267	787	3 403	–	25 457
1987	22 476	870	3 022	–	26 368
1988(a)	22 867	835	2 964	–	26 666
1989	26 082	948	3 103	–	30 133
1970-71	1 500	797	69	–	2 366
1971-72(a)	3 707	723	–	–	4 430
1972-73	4 551	322	–	–	4 873
1973-74	5 228	387	–	–	5 615
1974-75	7 416	592	10	–	8 018
1975-76	6 738	448	7	–	7 193
1976-77(a)	7 827	394	–	–	8 221
1977-78	8 897	678	17	–	9 592
1978-79	9 659	671	28	–	10 358
1979-80	10 277	786	81	–	11 144
1980-81	11 426	855	76	–	12 357
1981-82	11 164	806	657	–	12 627
1982-83	14 574	946	1 579	–	17 099
1983-84	15 989	1 004	1 596	–	18 589
1984-85	17 675	815	3 103	–	21 593
1985-86	19 932	811	3 731	–	24 474
1986-87	23 368	898	3 656	–	27 922
1987-88	21 417	799	2 704	–	24 920
1988-89(a)	23 313	826	3 207	–	27 346
1989-90	29 331	977	2 563	–	32 871

(a) 53 week year

Table 26 – UNDERGROUND COAL PRODUCTION BY MINING UNITS, NSW

Year	Longwall			Continuous Miners (a)		
	No. of faces (b)	Raw production ('000 tonnes)	Percent of underground production	No. of units (b)	Raw production ('000 tonnes)	Percent of underground production
1978-79	3	1 624	4.3	n.a.	36 581	95.7
1979-80	4	1 500	4.2	n.a.	33 862	95.8
1980-81	5	2 172	5.0	n.a.	41 085	95.0
1981-82	6	3 387	7.6	364	41 143	92.4
1982-83(c)	8	4 880	10.5	354	41 386	89.5
1983-84	8	6 446	15.1	348	36 181	84.9
1984-85	12	8 513	20.2	328	33 545	79.8
1985-86	15	11 647	25.9	324	33 271	74.1
1986-87	18	16 567	32.0	307	35 277	68.0
1987-88	18	17 543	39.6	n.a.	26 781	60.4
1988-89(c)	18	19 250	42.2	261	26 347	57.8
1989-90	19	22 384	43.8	260	28 664	56.2

(a) Includes development machines (b) End of year (c) 53-week year

Table 27 – LONGWALL COAL PRODUCTION BY DISTRICTS, NSW
('000 tonnes raw)

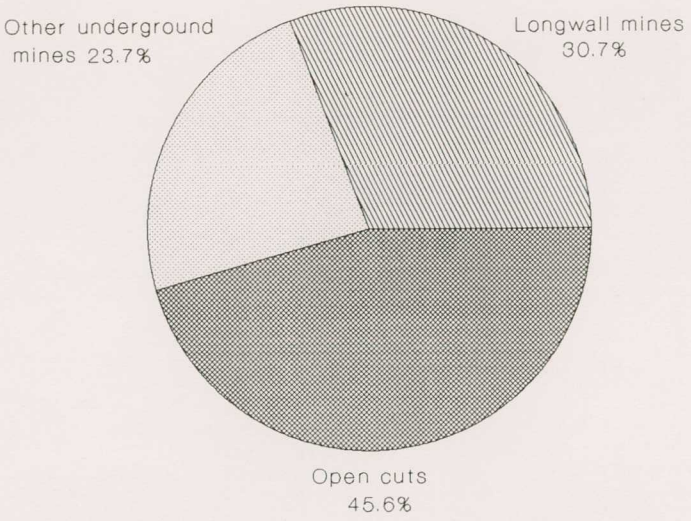
Year	Singleton-North West		Newcastle		West		South	
	No. of faces	Production	No. of faces	Production	No. of faces	Production	No. of faces	Production
1978-79	–	–	–	–	–	–	3	1 624
1979-80	–	–	–	–	1	340	3	1 160
1980-81	–	–	–	–	1	660	4	1 512
1981-82	–	–	1	n.a.	1	790	4	2 597
1982-83(a)	–	–	2	582	1	975	5	3 323
1983-84	–	–	2	1 574	1	872	5	4 000
1984-85	–	–	5	3 187	2	798	5	4 528
1985-86	1	216	5	3 735	4	2 406	5	5 290
1986-87	2	1 683	6	5 929	4	3 172	6	5 783
1987-88	2	1 308	6	5 351	3	4 417	7	6 467
1988-89(a)	1	625	6	5 812	3	4 514	8	8 299
1989-90	1	391	6	7 049	3	4 254	9	10 690

(a) 53 week year

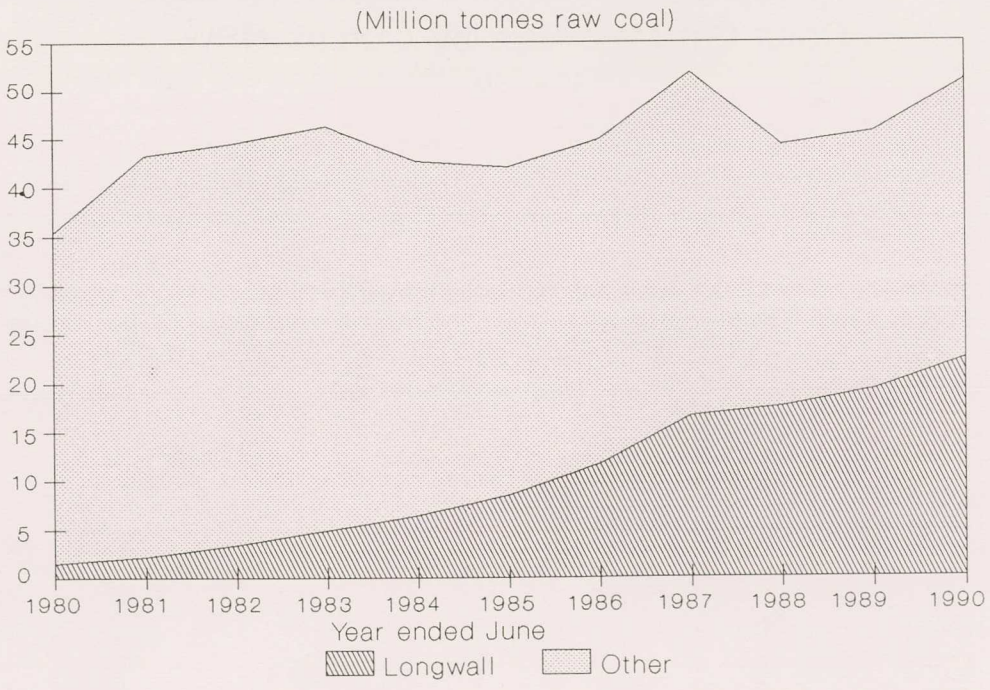
Table 28 – CUMULATIVE RAW COAL PRODUCTION, NSW
('000 tonnes)

District	Prior to 1900	1900 to 1949	1950 to 1989	Total to end of 1989
Singleton-North West	573	8 021	409 448	418 042
Newcastle	62 126	302 699	506 511	871 336
West	6 008	63 237	175 290	244 535
South	17 046	93 400	434 006	544 452
NSW	**85 753**	**467 357**	**1 525 255**	**2 078 365**

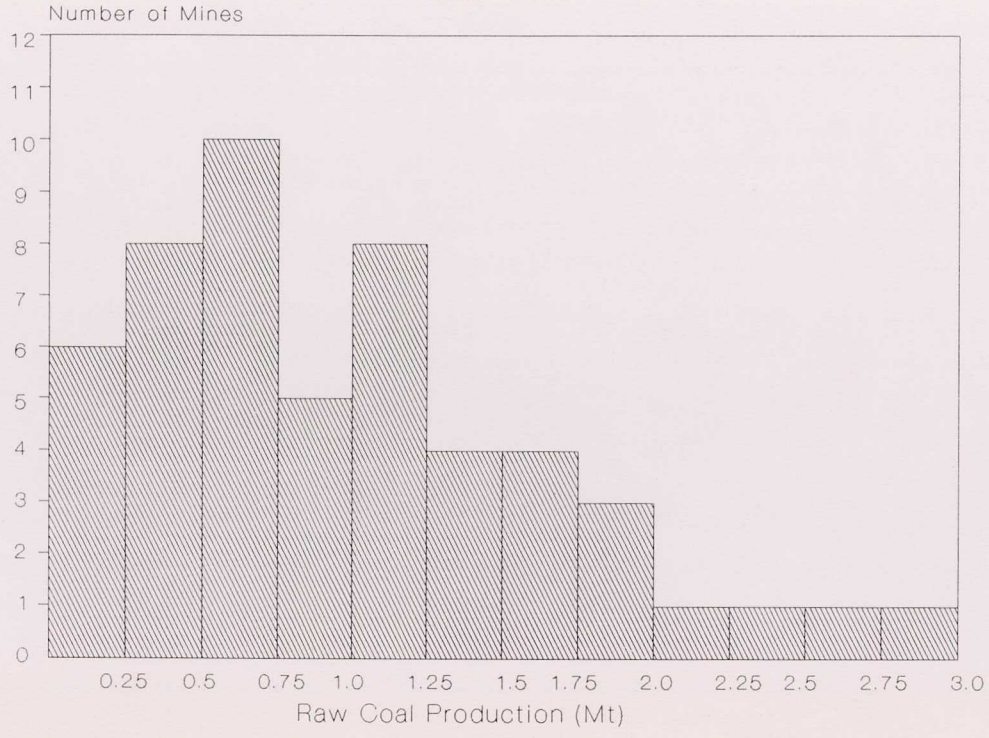
Production by Type of Mine, 1989-90
Raw Coal



NSW Underground Production By Method



Underground Mine Size by Output, NSW
1989-90



Open Cut Mine Size by Output, NSW
1989-90

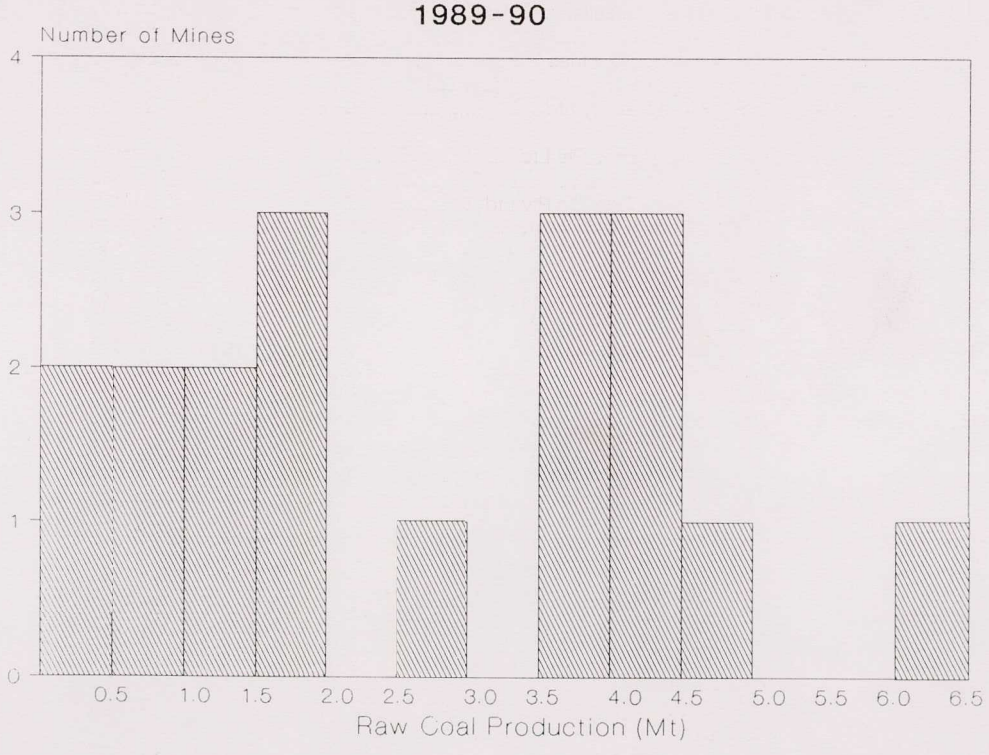
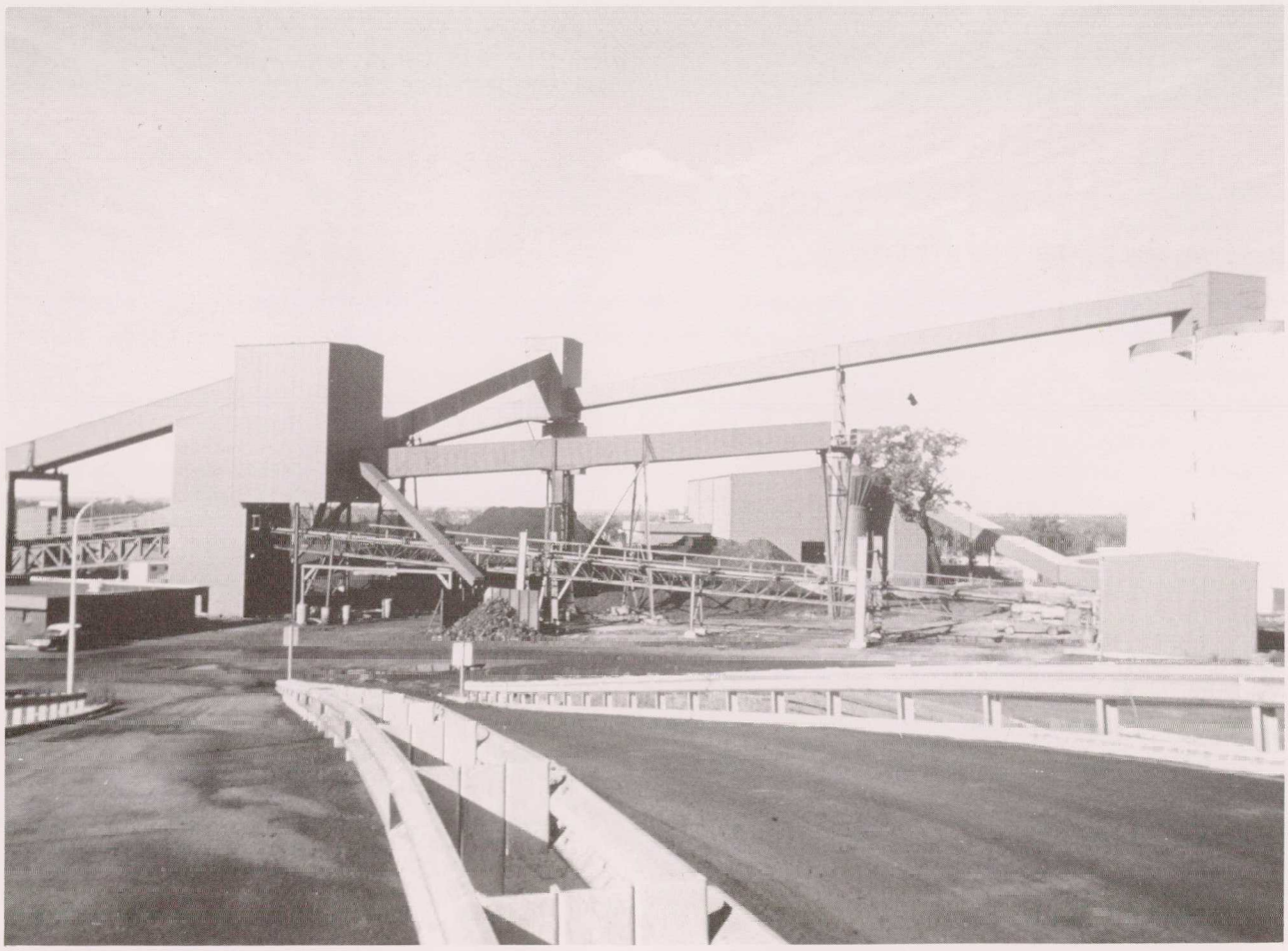


Table 29 – COAL PRODUCTION BY MINES, NSW, 1989-90

Mine	Company	Production (tonnes) Raw	Saleable
Singleton – North West –			
Bayswater No. 2 O/C	Bayswater Colliery Co Pty Ltd	1 453 500	1 430 800
Drayton O/C	Drayton Coal Pty Ltd	3 527 400	3 527 400
Great Greta	Barix Pty Ltd (FAI Mining Ltd)	402 000	402 000
Gunnedah No. 2	Gunnedah Coal Co Ltd	644 700	537 000
Gunnedah O/C	Gunnedah Coal Co Ltd	546 600	420 300
Howick O/C	Novacoal Australia Pty Ltd	3 739 800	2 822 200
Hunter Valley No. 1 O/C	Coal & Allied Industries Ltd	6 407 300	4 540 600
Lemington No. 1	Lemington Coal Mines Ltd	851 700	603 400
Lemington O/C	Lemington Coal Mines Ltd	1 731 900	1 233 400
Liddell	Liddell Joint Venture	574 300	426 200
Liddell State	Elcom Collieries Pty Ltd	543 700	520 500
Mount Thorley O/C	Coal & Allied Industries Ltd	4 926 700	3 598 300
Muswellbrook No. 2	Muswellbrook Coal Co Ltd	305 800	305 800
Muswellbrook O/C	Muswellbrook Coal Co Ltd	1 130 300	1 088 200
Preston Extended	Preston Coal Holdings Pty Ltd	343 300	343 300
Ravensworth O/C	Costain Australia Ltd	4 285 200	4 060 100
Saxonvale O/C	Saxonvale Coal Pty Ltd	2 810 900	1 932 000
Swamp Creek O/C	Hebden Mining Co	1 889 600	1 777 600
United O/C	United Collieries Pty Ltd	146 400	103 900
Vickery	Novacoal Australia Pty Ltd	101 400	97 200
Wambo	Wambo Mining Corporation Pty Ltd	1 081 300	744 100
Wambo O/C	Wambo Mining Corporation Pty Ltd	504 900	339 600
Warkworth No. 1 O/C	Warkworth Mining Ltd	3 511 200	2 457 100
Newcastle –			
Awaba State	Elcom Collieries Pty Ltd	1 047 700	1 047 700
Bloomfield	Bloomfield Collieries Pty Ltd	213 500	123 100
Bloomfield O/C	Bloomfield Collieries Pty Ltd	1 579 900	936 600
Chain Valley	Coal & Allied Industries Ltd	849 400	824 900
Cooranbong	Newcom Collieries Pty Ltd	1 213 200	1 213 200
Gretley	The Newcastle Wallsend Coal Co Pty Ltd	1 040 500	582 500
Lambton	FAI Mining Ltd	623 500	623 500
Moonee	Coal & Allied Industries Ltd	637 900	594 000
Munmorah State	Elcom Collieries Pty Ltd	1 222 300	1 222 300
Myuna	Newcom Collieries Pty Ltd	1 450 300	1 450 300
Newstan	Elcom Collieries Pty Ltd	2 150 300	1 646 600
Newvale No. 1	Elcom Collieries Pty Ltd	909 800	909 800
Newvale No. 2	Elcom Collieries Pty Ltd	306 300	306 300
Pelton/Ellalong	The Newcastle Wallsend Coal Co Pty Ltd	1 750 400	1 421 900
Teralba	FAI Mining Ltd	1 184 400	880 500
Wallarah	Coal & Allied Industries Ltd	832 600	775 900
West Wallsend	FAI Mining Ltd	1 411 900	1 116 900
Wyee State	Elcom Collieries Pty Ltd	1 725 900	1 725 900
West –			
Angus Place	Newcom Collieries Pty Ltd	1 278 800	1 278 800
Baal Bone	Coalex Pty Ltd	1 900 000	1 593 600
Blue Mountains	Hartley Valley Coal Co Pty Ltd	194 200	164 700
Charbon	B.C.S.C. Collieries Pty Ltd	606 200	470 800
Clarence	Coalex Pty Ltd	1 705 400	1 602 500
Invincible	Coalpac Pty Ltd	194 300	180 200
Ivanhoe No. 2	B.C.S.C. Collieries Pty Ltd	348 600	333 500
Kandos No. 3	Kandos Collieries Pty Ltd	133 400	133 400
Ulan No. 2	Ulan Coal Mines Ltd	1 753 300	1 750 800
Ulan O/C	Ulan Coal Mines Ltd	4 471 700	2 451 600
Western Main	Novacoal Australia Pty Ltd	571 100	494 600
Western Main O/C	Novacoal Australia Pty Ltd	127 900	112 000
South –			
Appin	BHP Co Ltd	2 271 800	2 250 200
Avon	Avon Colliery Pty Ltd	270 600	239 900
Berrima	B.C.S.C. Collieries Pty Ltd	245 700	245 700
Brimstone	Clutha Ltd	1 074 300	856 100
Coal Cliff	Kembla Coal & Coke Pty Ltd	1 340 100	1 138 900
Cordeaux	BHP Co Ltd	2 515 500	2 482 700
Kemira	BHP Co Ltd	958 800	958 800
Metropolitan	Metropolitan Collieries Ltd	662 100	566 100
Nattai	Clutha Ltd	471 000	379 600
Nebo	BHP Co Ltd	477 700	477 700
North Cliff	Kembla Coal & Coke Pty Ltd	38 000	32 800
Oakdale	Clutha Ltd	705 700	552 700
South Bulli	Austen & Butta Ltd	2 882 700	2 055 800
Tahmoor	Kembla Coal & Coke Pty Ltd	1 747 600	1 451 000
Tower	BHP Co Ltd	1 055 300	1 054 900
West Cliff	Kembla Coal & Coke Pty Ltd	1 570 000	1 332 600
Wongawilli	BHP Co Ltd	658 100	658 100

COMPANY/MINE DIRECTORY



Surface facilities, Tahmoor colliery

AUSTEN & BUTTA LTD

10th Floor
221 Miller Street
North Sydney NSW 2060
PO Box 1228
North Sydney NSW 2059
Phone: (02) 968 0888
Telex: AA72430
Fax: (02) 968 0808
Contact Officer: I T Dunlop, Managing Director

Ownership: The major shareholder in Austen & Butta is Shell Australia Ltd 50%

Activity: Austen & Butta Ltd operates the South Bulli colliery, the largest underground mine in Australia, producing hard coking and steaming coals for export markets

Operating mine:

South Bulli
Location: 13km north of Wollongong
PO Box 17
Corrimal NSW 2518
Phone: (042) 83 0111
Fax:: (042) 83 0101
Manager: M Ogilvie

AVON COLLIERY PTY LTD

Bong Bong Road
West Dapto NSW 2530
PO Box 220
Wollongong East NSW 2520
Phone: (042) 61 1388
Fax: (042) 76 1384
Contact Officer: F Gardner, Manager

Ownership: Wholly-owned by South Coast Equipment Pty Ltd (through Avon Properties Pty Ltd)

Activity: Avon Colliery Pty Ltd operates the Avon mine producing steaming coal for export markets

Operating mine:

Avon
Location: Dapto, southwest of Wollongong
PO Box 20
Wollongong East NSW 2520
Phone: (042) 62 1126
Fax: (042) 61 1889
Manager: J Hetherington

BAYSWATER COLLIERY CO PTY LTD

Caltex House
167-187 Kent Street
Sydney NSW 2000
GPO Box 1517
Sydney NSW 2001
Phone: (02) 250 5000
Telex: AA120244
Fax: (02) 250 5702
Contact Officer: G N Sharrock, General Manager

Ownership: Caltex Oil (Australia) Pty Ltd 55%, AMP Society 35% and Nippon Oil (Australia) Pty Ltd 10%

Activity: Bayswater Colliery Co Pty Ltd operates the Bayswater open cut mine supplying semi-soft coking and steaming coals to export markets and steaming coal to domestic power stations (Liddell and Bayswater)

Operating mine:

Bayswater No 2 open cut
Location: 10km south of Muswellbrook
Private Mail Bag No 8
Muswellbrook NSW 2333
Phone: (065) 43 4488
Fax: (065) 42 5031
Manager: R Hopps

B.C.S.C. COLLIERIES PTY LTD

Portland House
1 McLaren Street
North Sydney NSW 2060
GPO Box 1571
Sydney NSW 2001
Phone: (02) 925 9888
Telex: AA22466
Fax:: (02) 929 4520
Contact Officer: W Baer, General Manager

Ownership: Wholly-owned by Blue Circle Southern Cement Ltd, a subsidiary of Boral Ltd

Activity: BCSC Collieries Pty Ltd operates three underground mines - Berrima, Charbon and Ivanhoe No 2 - supplying semi-soft coking and steaming coals to export markets and steaming coal to BCSC cement works and other domestic markets

Operating mines:

Berrima
Location: Berrima near Moss Vale
PSB No 4
Moss Vale NSW 2577
Phone: (048) 77 1206
Fax: (048) 77 1373
Manager: A Bell

Charbon
Location: Kandos, 90km north of Lithgow
PO Box 84
Kandos NSW 2848
Phone: (063) 79 4404
Fax: (063) 79 4427
Manager: W Irvine

Ivanhoe No 2
Location: 20km north of Lithgow
PO Box 52
Portland NSW 2847
Phone: (063) 55 1477
Fax: (063) 55 1526
Manager: S Thornton

BHP STEEL INTERNATIONAL GROUP – COLLIERIES DIVISION

Level 4, AMP Centre
90 Crown Street
Wollongong NSW 2500
PO Box 431
Wollongong East NSW 2520
Phone: (042) 24 2300
Telex: AA28560
Fax: (042) 26 1846
Contact Officer: Dr J E Lewis, General Manager

Ownership: The Broken Hill Proprietory Co Ltd (BHP)

Activity: BHP Steel International Group operates six underground mines in the southern coalfield. Raw coal from the mines is delivered to BHP's Port Kembla steelworks where it is washed and blended in the steelworks' washeries. The coal is used by BHP for iron and steel making. In recent years significant tonnages of both coal and coke from the steelworks have also been sold on export markets

Operating mines:

Appin
Location: 40km northwest of Wollongong
PO Appin NSW 2560
Phone: (046) 31 1256
Fax: (046) 31 1505
Manager: D Crandon

Cordeaux
Location: 25km northwest of Wollongong
PO Box 199
Figtree NSW 2525
Phone: (042) 29 2599
Fax: (042) 26 2527
Manager: S Pratt

Kemira
Location: 4km west of Wollongong
PO Box 148
Figtree NSW 2525
Phone: (042) 29 3055
Fax: (042) 26 3124
Manager: P Eade

Nebo
Location: 10km west of Wollongong
PO Kembla Heights NSW 2526
Phone: (042) 71 1366
Fax: (042) 71 8048
Manager: S David

Tower
Location: 40km northwest of Wollongong
PO Box 21
Wilton NSW 2571
Phone: (046) 30 9308
Fax: (046) 30 9061
Manager: G Weatherstone

Wongawilli
Location: 15km southwest of Wollongong
PO Box 288
Dapto NSW 2530
Phone: (042) 61 1788
Fax: (042) 62 1642
Manager: A Richardson

BLOOMFIELD COLLIERIES PTY LTD

4 Mile Creek Road
East Maitland NSW 2323
PO Box 4
East Maitland NSW 2323
Phone: (049) 33 7077
Fax: (049) 33 8940
Contact Officer: G Bellamy, Commercial Manager

Ownership: Wholly-owned by Big Ben Holdings Pty Ltd

Activity: Bloomfield Collieries Pty Ltd operates Rix's Creek open cut and the Bloomfield underground and open cut mines supplying soft/semi-soft coking and steaming coals to export markets

Operating mines:

Bloomfield, Bloomfield open cut
Location: Maitland
PO Box 4
East Maitland NSW 2323
Phone: (049) 33 7805
Fax: (049) 33 8940
Manager: J Prance (underground mine)
I Kennerson (open cut)

Rix's Creek open cut
Location:5km north of Singleton
PO Box 4
East Maitland NSW 2323
Phone: (049) 33 7805
Fax: (049) 33 8940
Manager: R Crick

CAMBERWELL COAL PTY LTD

PMB No 7
Singleton NSW 2330
Phone: (065) 77 4111
Fax: (065) 71 1188
Contact Officer: R Gazzard, General Manager

Ownership: Owned in joint venture by Navidale Pty Ltd (a subsidiary of Henry Walker Group Ltd) 50%, Toyota Tsusho Mining (Australia) Pty Ltd 40% and Dia Coal Mining (Australia) Pty Ltd 10%

Activity: Camberwell Coal Pty Ltd is developing the new Camberwell open cut export mine (soft/semi-soft coking and steaming coals). Regular production is scheduled to commence by April 1991.

Operating mine:

Camberwell open cut
Location: 10km north of Singleton
PMB No 7
Singleton NSW 2330
Phone: (065) 77 4111
Fax: (065) 71 1188
Manager: J Clayton

CLUTHA LTD

Level 18
1 York Street
Sydney NSW 2000
Phone: (02) 251 2866
Telex: AA177586
Fax: (02) 251 2821
Contact Officer: J Doherty, Chief Executive

Ownership: The major shareholder in Clutha Ltd is Brimstone Securities Ltd 38.0%, a subsidiary of Australian Consolidated Minerals Ltd

Activity: Clutha Ltd operates three underground mines - Brimstone, Oakdale, Nattai - supplying semi-hard and semi-soft coking and steaming coals to export markets

Operating mines:

Brimstone
Location: Burragorang Valley
PO Box 12
Narellan NSW 2567
Phone: (046) 59 6335
Fax: (046) 59 6475
Manager: D Smith

Nattai
Location: Burragorang Valley
PO Box 12
Narellan NSW 2567
Phone: (046) 59 6235
Fax: (046) 59 6475
Manager: C Taylor

Oakdale
Location: Burragorang Valley
PO Box 12
Narellan NSW 2567
Phone: (046) 59 6236
Fax: (046) 59 6475
Manager: S Bracken

COAL & ALLIED INDUSTRIES LTD

1 York Street
Sydney NSW 2000
GPO Box 1554
Sydney NSW 2001
Phone: (02) 233 4122
Telex: AA21226
Fax: (02) 251 3395
Contact Officer: A Haraldson, Chief Executive

Ownership: The major shareholders in Coal & Allied are National Mutual Life Association 10%, Ube Industries Ltd 10% and Nissho Iwai Corporation 7.3%

Activity: Coal & Allied operates five mines - Chain Valley, Moonee, Wallarah, Hunter Valley open cut and Mount Thorley open cut. The Mount Thorley mine is operated through the Coal & Allied subsidiary R W Miller & Co Pty Ltd. Pohang Iron and Steel Co (Republic of Korea) has a 20% interest in the Mount Thorley mine. Coal & Allied also has a 50% interest in the Swamp Creek mine (see Hebden Mining Co). Coal & Allied supplies soft and semi-soft coking and steaming coals to export markets and steaming coal to domestic power stations and industrial markets

Operating mines:

Chain Valley
Location: 48km south of Newcastle
PO Mannering Park NSW 2259
Phone: (043) 58 8146
Fax: (043) 58 8033
Manager: G Cole-Clark

Moonee
Location: 35km south of Newcastle
PO Catherine Hill Bay NSW 2301
Phone: (049) 76 2033
Fax: (049) 76 2316
Manager: E Smith

Wallarah
Location: 35km south of Newcastle
PO Catherine Hill Bay NSW 2301
Phone: (049) 76 1633
Fax: (049) 76 2520
Manager: J Samuel

Hunter Valley No 1 open cut
Location: 15km northwest of Singleton
PO Box 315
Singleton NSW 2330
Phone: (065) 72 3600
Fax: (065) 76 1063
Manager: M Renshaw

Mount Thorley open cut
Location: 10km southwest of Singleton
PO Box 321
Singleton NSW 2330
Phone: (065) 74 6688
Fax: (065) 74 6617
Manager: J Thorsen

COALPAC PTY LTD

Astrolabe
Rutherford Lane
Lithgow NSW 2790
Phone: (063) 51 2281
Fax: (063) 52 1339
Contact Officer: N Craven, Director

Ownership: Owned by Noette Pty Ltd in which N Craven is the major shareholder

Activity: Coalpac Pty Ltd operates the Invincible and Canyon steaming coal mines. Output from the mines is sold to Austen & Butta Ltd for export

Operating mines:

Invincible
Location: 25km north of Lithgow
Astrolabe
Rutherford Lane
Lithgow NSW 2790
Phone: (063) 59 0600
Fax: (063) 59 0608
Manager: J Cornock

Canyon
Location: 15km southeast of Lithgow
Astrolabe
Rutherford Lane
Lithgow NSW 2790
Phone: (063) 59 0600
Fax: (063) 59 0608
Manager: B Thomas

CRA LIMITED, see

- Kembla Coal & Coke Pty Ltd
- Novacoal Australia Pty Ltd

COSTAIN AUSTRALIA LTD

2 Dind Street
Milsons Point NSW 2061
PO Box 231
Milsons Point NSW 2061
Phone: (02) 922 6444
Telex: AA122352
Fax: (02) 959 5418
Contact Officer: R Knights, Director Coal

Ownership: Wholly-owned by the UK Costain Group Plc

Activity: Costain Australia Ltd operates the Ravensworth open cut mine under contract to the Electricity Commission of NSW. Ouptput from the mine is supplied to Bayswater and Liddell power stations. Costain Australia Ltd also has a 28.75% interest in, and manages, the Warkworth open cut mine (see Warkworth Mining Ltd)

Operating mine:

Ravensworth open cut
Location: 20km northwest of Singleton
PO Box 294
Muswellbrook NSW 2333
Phone: (065) 72 4055
Fax: (065) 76 1204
Manager: J Wasik

DRAYTON COAL PTY LTD

Greta Road
Muswellbrook NSW 2333
Private Mail Bag No 9
Muswellbrook NSW 2333
Phone: (065) 43 1733
Telex: AA63876
Fax: (065) 42 5009
Contact Officer: G McRobert, General Manager

Ownership: Drayton is owned in joint venture by Shell Australia Ltd 74.8%, AMP Society 13.4%, Mitsui Coal Development (Australia) Pty Ltd 3.8%, Mitsui Mining Australia Pty Ltd 3.0%, Daesung Australia Pty Ltd 2.5%, Hyundai Australia Pty Ltd 2.5%

Activity: Drayton Coal Pty Ltd operates the Drayton open cut mine supplying steaming coal to export markets and domestic power stations (Liddell and Bayswater)

Operating mine:

Drayton open cut
Location: 10km south of Muswellbrook
Private Mail Bag No 9
Muswellbrook NSW 2333
Phone: (065) 43 1733
Fax: (065) 42 5009
Manager: D Isles

ELECTRICITY COMMISSION OF NSW

The Commission, a statutory body of the NSW Government, owns and operates captive coal mines through its subsidiary companies Elcom Collieries Pty Ltd and Newcom Collieries Pty Ltd.

Elcom Collieries Pty Ltd
(mines: Awaba State, Liddell State, Munmorah State, Newstan, Newvale No 1, Newvale No 2, Wyee State)
52 Pendlebury Road
Cardiff NSW 2285
Private Mail Bag
Post Office
Cardiff NSW 2285
Phone: (049) 54 2800
Telex: AA28094
Fax: (049) 54 5506
Contact Officer: R Williams, Chief Executive

Newcom Collieries Pty Ltd
(mines: Angus Place, Cooranbong, Myuna)
1st Floor, The Forum
244 Pacific Highway
Charlestown NSW 2290
PO Box 345
Charlestown NSW 2290
Phone: (049) 42 0800
Telex: AA28380
Fax: (049) 42 2108
Contact Officer: P McCarthy, General Manager

Operating mines:

Awaba State
Location: 30km southwest of Newcastle
PO Box 72
Toronto NSW 2283
Phone: (049) 59 1088
Fax: (049) 59 4171
Manager: V Istomin

Liddell State
Location: 28km northwest of Singleton
PO Box 246
Singleton NSW 2330
Phone: (065) 72 1066
Fax: (065) 76 1044
Manager: P Healey

Munmorah State
Location: 55km south of Newcastle
Private Mail Bag
Budgewoi NSW 2262
Phone: (043) 99 1388
Fax: (043) 90 7884
Manager: B Connolly

Newstan
Location: 25km southwest of Newcastle
PO Toronto NSW 2283
Phone: (049) 59 1266
Fax: (049) 50 4230
Manager: J Simpson

Newvale No 1
Location: 50km south of Newcastle
PO Mannering Park NSW 2259
Phone: (043) 58 8161
Fax: (043) 58 1272
Manager: R Leggett

Newvale No 2
Location: 55km south of Newcastle
PO Box 195
Toukley NSW 2263
Phone: (043) 90 9600
Fax: (043) 99 1046
Manager: B McKinnon

Wyee State
Location: 50km south of Newcastle
PO Mannering Park NSW 2259
Phone: (043) 58 8193
Fax: (043) 58 1892
Manager: J Beddow

Angus Place
Location: 15km north of Lithgow
PO Box 42
Wallerawang NSW 2845
Phone: (063) 55 1308
Fax: (063) 55 1493
Manager: J Galvin

Cooranbong
Location: 35km southwest of Newcastle
PO Box 36
Dora Creek NSW 2264
Phone: (049) 73 2777
Fax: (049) 70 5300
Manager: R Gibbons

Myuna
Location: 35km south of Newcastle
PO Box 1
Wangi Wangi NSW 2267
Phone: (049) 75 2044
Fax: (049) 75 3750
Manager: R Howarth

FAI MINING LTD

Cnr Market and Scott Streets
Newcastle NSW 2300
PO Box 841
Newcastle NSW 2300
Phone: (049) 29 6477
Telex: AA28949
Fax: (049) 29 6025
Contact Officer: P Gibb, Chief Executive

Ownership: Wholly-owned by FAI Insurances Ltd

Activity: FAI operates five mines through subsidiary companies Barix Pty Ltd (mine: Great Greta) and Pacific Copper Ltd (mines: Teralba, West Wallsend, Lambton, Westside). FAI mines supply coking coal to the Newcastle steelworks and soft coking and steaming coals to export markets

Operating mines:

Great Greta
Location: 25km east of Singleton
PO Box 309
Singleton NSW 2330
Phone: (065) 77 6123
Fax: (065) 77 6169
Manager: M Minter

Lambton
Location: 15km southwest of Newcastle
PO Redhead NSW 2290
Phone: (049) 49 7088
Fax: (049) 49 9209
Manager: R Slee

Teralba
Location: 20km southwest of Newcastle
PO Box 8
Teralba NSW 2284
Phone: (049) 58 3988
Fax: (049) 58 4468
Manager: N Hamilton

West Wallsend
Location: 25km southwest of Newcastle
PO Killingworth NSW 2301
Phone: (049) 53 2944
Fax: (049) 53 2986
Manager: D McDonald

Westside open cut
Location: 25km southwest of Newcastle
PO Box 40
Boolaroo NSW 2284
Phone: (049) 58 1655
Fax: (049) 58 4313
Manager: N Rae

GUNNEDAH COAL CO LTD

69 Pitt Street
Sydney NSW 2000
GPO Box 5134
Sydney NSW 2001
Phone: (02) 27 4841
Telex: AA75748
Fax: (02) 251 1269
Contact Officer: R McCullough, General Manager

Ownership: Wholly-owned by Australian Mining Investments Ltd in which the largest shareholder is Toyo Menka Kaisha Ltd 47.9%

Activity: Gunnedah Coal Co Ltd operates the Gunnedah underground and open cut mines supplying soft/semi-soft coking and steaming coals to export markets

Operating mines:

Gunnedah, Gunnedah open cut
Location: 10km southwest of Gunnedah
PO Box 600
Gunnedah NSW 2380
Phone: (067) 42 2933
Fax: (067) 42 3607
Manager: M Price (underground mine)
R Simpson (open cut)

HARTLEY VALLEY COAL CO PTY LTD

Gap Road
Lithgow NSW 2790
PO Box 57
Lithgow NSW 2790
Phone: (063) 55 2202
Fax: (063) 55 1100
Contact Officer: D A Facchina, General Manager

Ownership: Owned by Facchina Holdings Pty Ltd

Activity: Hartley Valley Coal Co Pty Ltd operates the Blue Mountains mine supplying steaming coal to domestic markets

Operating mine:

Blue Mountains
Location: 5km south of Lithgow
PO Box 57
Lithgow NSW 2790
Phone: (063) 55 2202
Fax: (063) 55 2297
Manager: R Smith

HEBDEN MINING CO

PO Box 269
Muswellbrook NSW 2333
Phone: (065) 76 1190
Telex: AA127196
Fax: (065) 76 1064
Contact Officer: B O'Neill, Manager

Ownership: Owned in joint venture by Coal & Allied Industries Ltd 50% and Oakbridge Ltd 50%

Activity: Hebden Mining Co operates the Swamp Creek open cut under contract to the Electricity Commission of NSW supplying coal to Bayswater and Liddell power stations

Operating mine:

Swamp Creek open cut
Location: 25km northwest of Singleton
PO Box 269
Muswellbrook NSW 2333
Phone: (065) 76 1190
Fax: (065) 76 1064
Manager: B O'Neill

KANDOS COLLIERIES PTY LTD

Kandos NSW 2848
Phone: (063) 79 4100
Contact Officer: D Carey, Manager

Ownership: Owned by Australian Cement Ltd (CSR Ltd 50%, Pioneer International Ltd 50%)

Activity: Kandos Collieries Pty Ltd operates the Kandos No 3 mine supplying coal to the Kandos cement works

Operating mine:

Kandos No 3
Location: 90km north of Lithgow
Kandos NSW 2848
Phone: (063) 79 4100
Manager: D Carey

KEMBLA COAL & COKE PTY LTD (KCC)

4th Floor
Crown Central
Crown & Keira Streets
Wollongong NSW 2500
PO Box 1770
Wollongong NSW 2500
Phone: (042) 28 7455
Telex: AA29172
Fax: (042) 28 4410
Contact Officer: J Stewart, Managing Director

Ownership: Wholly-owned by CRA Ltd in which the Rio Tinto Zinc Corporation Plc has a 49% interest

Activity: KCC operates four underground mines in the southern coalfield - Coal Cliff, West Cliff, North Cliff and Tahmoor. The mines produce hard coking and steaming coals for export and domestic markets

Operating mines:

Coal Cliff
Location: 30km north of Wollongong
Private Mail Bag No 1
PO Thirroul NSW 2515
Phone: (042) 94 1555
Fax: (042) 94 0148
Manager: P Smith

West Cliff
Location: 45km northwest of Wollongong
Private Mail Bag
Appin NSW 2560
Phone: (046) 31 1444
Fax: (046) 31 1555
Manager: M Jakeman

Tahmoor
Location: 50km northwest of Wollongong
PO Box 42 Picton NSW 2571
Phone: (046) 84 1259
Fax: (046) 84 1008
Manager: P Wynne

North Cliff
Location: 43km northwest of Wollongong
Private Mail Bag
Appin NSW 2560
Phone: (042) 94 3000
Fax: (042) 94 3100
Manager: B Garland

LEMINGTON COAL MINES LTD

Comleroi Road
Warkworth via Singleton NSW 2330
PO Box 225
Singleton NSW 2330
Phone: (065) 74 4566
Telex: AA73984
Fax: (065) 74 4610
Contact Officer: P Graham, General Manager

Ownership: Wholly-owned by Exxon Coal and Minerals Australia Ltd

Activity: Lemington Coal Mines Ltd operates the Lemington underground and open cut mines supplying soft coking and steaming coals to export markets

Operating mines:

Lemington, Lemington open cut
Location: 15km west of Singleton
PO Box 225
Singleton NSW 2330
Phone: (065) 74 4566
Fax: (065) 74 4610
Manager: J Janetzki (underground mine)
R Gibson (open cut)

LIDDELL JOINT VENTURE

Managed by: Yieldex Pty Ltd (agent for the Joint Venture)
Yieldex Pty Ltd
Suite 2, Level 14
Norwich House
6-10 O'Connell Street
Sydney NSW 2000
Phone: (02) 223 6455
Telex: AA178238
Fax: (02) 223 6524
Contact Officer: G Edwards, Chairman

Ownership: Liddell Joint Venture is made up of Savage Resources Ltd 61.5%, Marian Mining Pty Ltd 32.5% and Two Cities Pty Ltd 6.0%

Activity: The Liddell underground and open cut mines supply soft coking and steaming coals to export markets

Operating mines:

Liddell, Liddell open cut
Location: 25km northwest of Singleton
PO Box 7
Singleton NSW 2330
Phone: (065) 76 1121
Fax: (065) 76 1142
Manager: L Ireland (underground mine)
I Pankhurst (open cut)

METROPOLITAN COLLIERIES LTD

Level 7, The Denison
65 Berry Street
North Sydney NSW 2060
Phone: (02) 956 7522
Telex: AA171069
Fax: (02) 956 7463
Contact Officer: J Hort, General Manager

Ownership: Wholly-owned by Denehurst Ltd

Activity: Metropolitan Collieries operates the Metropolitan mine supplying coking and steaming coals to export and domestic markets

Operating mine:

Metropolitan
Location: Helensburgh
PO Box 10
Helensburgh NSW 2508
Phone: (042) 94 1222
Fax: (042) 94 2064
Manager: R Christie

MUSWELLBROOK COAL CO LTD

32-34 Queen Street
Muswellbrook NSW 2333
PO Box 123
Muswellbrook NSW 2333
Phone: (065) 43 2799
Telex: AA163821
Fax: (065) 42 5010
Contact Officer: M Smith, General Manager

Ownership: Wholly-owned by Idemitsu Kosan Co Ltd

Activity: Muswellbrook Coal Co operates the Muswellbrook underground and open cut mines supplying semi-soft coking and steaming coals to export markets and steaming coal to domestic power stations (Liddell and Bayswater)

Operating mines:

Muswellbrook No 2, Muswellbrook open cut
Location: Muswellbrook
PO Box 123
Muswellbrook NSW 2333
Phone: (065) 43 2799
Fax: (065) 42 5010
Manager: J Linde (underground mine)
D Hicks (open cut)

NOVACOAL AUSTRALIA PTY LTD

110 Alfred Street
Milsons Point NSW 2061
PO Box 354
Milsons Point NSW 2061
Phone: (02) 900 0444
Telex: AA20311
Fax: (02) 959 4197
Contact Officer: K Barden, Managing Director

Ownership: Wholly-owned by CRA Ltd in which the Rio Tinto Zinc Corporation Plc has a 49% interest

Activity: Novacoal Australia Pty Ltd operates four mines – Howick open cut, Westen Main underground and open cut and Vickery underground. The mines supply soft coking and steaming coals to export markets and steaming coal to domestic markets. Mitsubishi Corporation has a 40% interest in the Howick mine under an unincorporated joint venture arrangement with Novacoal Australia Pty Ltd. The Howick mine operates and trades as Howick Coal, an operating division of Novacoal.

Operating mines:

Howick open cut
Location: 25km northwest of Singleton
PO Box 12
Singleton NSW 2330
Phone: (065) 72 4166
Fax: (065) 76 1335
General Manager, Howick Coal: J Pegler
Mine Manager: B Schafferius

Vickery
Location: 25km north of Gunnedah
PO Box 399
Gunnedah NSW 2380
Phone: (067) 43 2551
Fax: (067) 43 2532
Manager: D Mellows

Western Main, Western Main open cut
Location: 10km northwest of Lithgow
PO Box 20
Wallerawang NSW 2845
Phone: (063) 55 1102
Fax: (063) 55 1809
Manager: R Hughes

OAKBRIDGE LTD

Level 9
100 Christie Street
St Leonards NSW 2065
PO Box 309
St Leonards NSW 2065
Phone: (02) 436 0555
Telex: AA26288
Fax: (02) 438 4630
Contact Officer: A B Lawrance, Managing Director

Ownership: At September 1990, over 90% of Oakbridge shares were held by an Australian-Japanese consortium led by McIlwraith McEacharn Ltd and including Toyo Menka Kaisha Ltd and Nippon Oil (Australia) Pty Ltd. Final shareholding is expected to be McIlwraith (27%), Toyo Menka (25%), Nippon Oil (23%), Australian Public (25%).

Activity: Oakbridge Ltd operates five mines through subsidiary companies Coalex Pty Ltd (mines: Baal Bone, Clarence), The Newcastle Wallsend Coal Co Pty Ltd (mines: Pelton/Ellalong, Gretley) and Saxonvale Coal Pty Ltd (mine: Saxonvale open cut). The Sumitomo Group of Companies has a 20% interest in Baal Bone. Kyodo Oil Co Ltd and Yukong Ltd each holds a 10% interest in the Clarence mine. Oakbridge Ltd also has a 50% interest in the Swamp Creek mine (see Hebden Mining Co).

The Oakbridge mines supply soft and semi-soft coking and steaming coals to export markets and steaming coal to domestic markets.

Operating mines:

Baal Bone
Location: 32km west of Lithgow
PO Box 13
Lithgow NSW 2790
Phone: (063) 59 0500
Fax: (063) 59 0530
Manager: E Morgan

Clarence
Location: 10km east of Lithgow
PO Box 92
Lithgow NSW 2790
Phone: (063) 55 2656
Fax: (063) 55 2720
Manager: N Gow

Pelton/Ellalong
Location: 12km east of Cessnock
PO Box 156
Cessnock NSW 2325
Phone: (049) 90 2188 (Pelton)
(049) 98 1640 (Ellalong)
Fax: (049) 91 1253 (Pelton)
(049) 98 1753 (Ellalong)
Manager: D Watson (Pelton)
M Barrett (Ellalong)

Gretley
Location: 16km west of Newcastle
PO Box 43
Wallsend NSW 2287
Phone: (049) 51 3944
Fax: (049) 51 5961
Manager: M Simes

Saxonvale open cut
Location: 16km south of Singleton
Private Mail Bag No 8
Singleton NSW 2330
Phone: (065) 74 6619
Fax: (065) 74 6742
Manager: S Butel

PRESTON COAL CO PTY LTD

PO Box 1A
Curlewis NSW 2381
Phone: (067) 42 0366
Fax: (067) 42 1983
Contact Officer: R G Cameron, Managing Director

Ownership: Europa Minerals Plc 50%, Messrs R G Cameron, B J Kirkpatrick and G Zamel 50%

Activity: Preston Coal Co Pty Ltd operates the Preston Extended mine supplying steaming coal for export

Operating mine:

Preston Extended
Location: 15km south of Gunnedah
PO Box 1A
Curlewis NSW 2381
Phone: (067) 42 0366
Fax: (067) 42 1983
Manager: B Kirkpatrick

ULAN COAL MINES LTD

Level 5
60 Miller Street
North Sydney NSW 2060
PO Box 1059
North Sydney NSW 2059
Phone: (02) 922 4000
Telex: AA71492
Fax: (02) 959 4619
Contact Officer: P Coates, General Manager

Ownership: Mitsubishi Development Pty Ltd 49%, Exxon Coal and Minerals Australia Ltd 36%, State Authorities Superannuation Board of NSW 15%

Activity: Ulan Coal Mines Ltd operates the Ulan underground and open cut mines supplying steaming coal to export and domestic markets. The mines are managed by Exxon

Operating mines:

Ulan No 2, Ulan open cut
Location: 30km northwest of Mudgee
Private Mail Bag
Mudgee NSW 2850
Phone: (063) 72 3455
Fax: (063) 73 4680 (underground mine)
(063) 73 4786 (open cut)
Manager: D Hetherington (underground mine)
C Gibson (open cut)

UNITED COLLIERIES PTY LTD

134 Jerry's Plains Road
Warkworth NSW 2330
PO Box 478
Singleton NSW 2330
Phone: (065) 74 4502
Telex: AA72020
Fax: (065) 74 4606
Contact Officer: C W Travelstead, Manager

Ownership: United Mineworkers' Federation of Australia 50%, Agip Coal Australia Pty Ltd 50%

Activity: United Collieries Pty Ltd operates the United open cut mine supplying semi-soft coking and steaming coals to export markets

Operating mine:

United open cut
Location: PO Box 478
Singleton NSW 2330
Phone: (065) 74 4502
Fax: (065) 74 4606
Manager: I Stevenson

WAMBO MINING CORP PTY LTD

Jerry's Plains Road
Warkworth via Singleton NSW 2330
Private Mail Bag
Singleton NSW 2330
Phone: (065) 74 4532
Telex: AA24767
Fax: (065) 74 4618
Contact Officer: R Moore, General Manager

Ownership: Sumitomo Coal Mining Co Ltd 75%, Government Insurance Office of NSW 12.5%, Total Holdings (Aust) Pty Ltd 12.5%

Activity: Wambo Mining Corp operates the Wambo underground and open cut mines suplying semi-soft coking and steaming coals to export markets

Operating mines:

Wambo, Wambo open cut
Location: 15km west of Singleton
Private Mail Bag
Singleton NSW 2330
Phone: (065) 74 4532
Fax: (065) 74 4618
Manager: J Sherrell (underground mine)
B Wright (open cut)

WARKWORTH MINING LTD

Putty Road
Mt Thorley via Singleton NSW 2330
PO Box 267
Singleton NSW 2330
Phone: (065) 78 9200
Telex: AA26077
Fax: (065) 78 9258
Contact Officer: R Knights, Director coal

Ownership: Costain Australia Ltd 28.75%, Mitsubishi Development Pty Ltd 22.75%, Minproc Holdings Ltd 20%, Wales Resources Fund 15%, Nippon Steel Australia Pty Ltd 7.5%, Mitsubishi Mining & Cement (Aust) Pty Ltd 6.0%

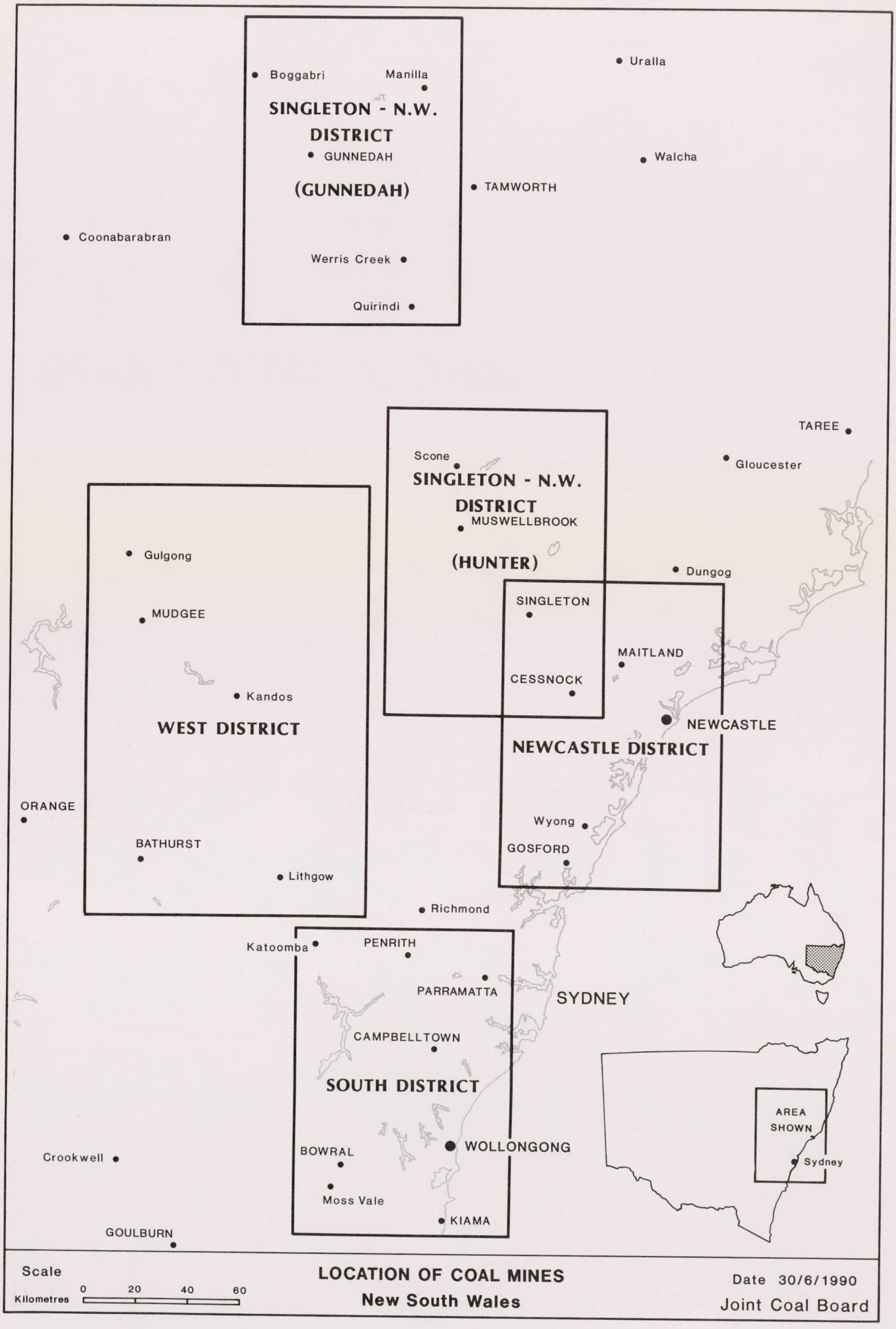
Activity: Warkworth Mining Ltd operates the Warkworth No 1 open cut mine supplying soft coking and steaming coals to export markets

Operating mine:

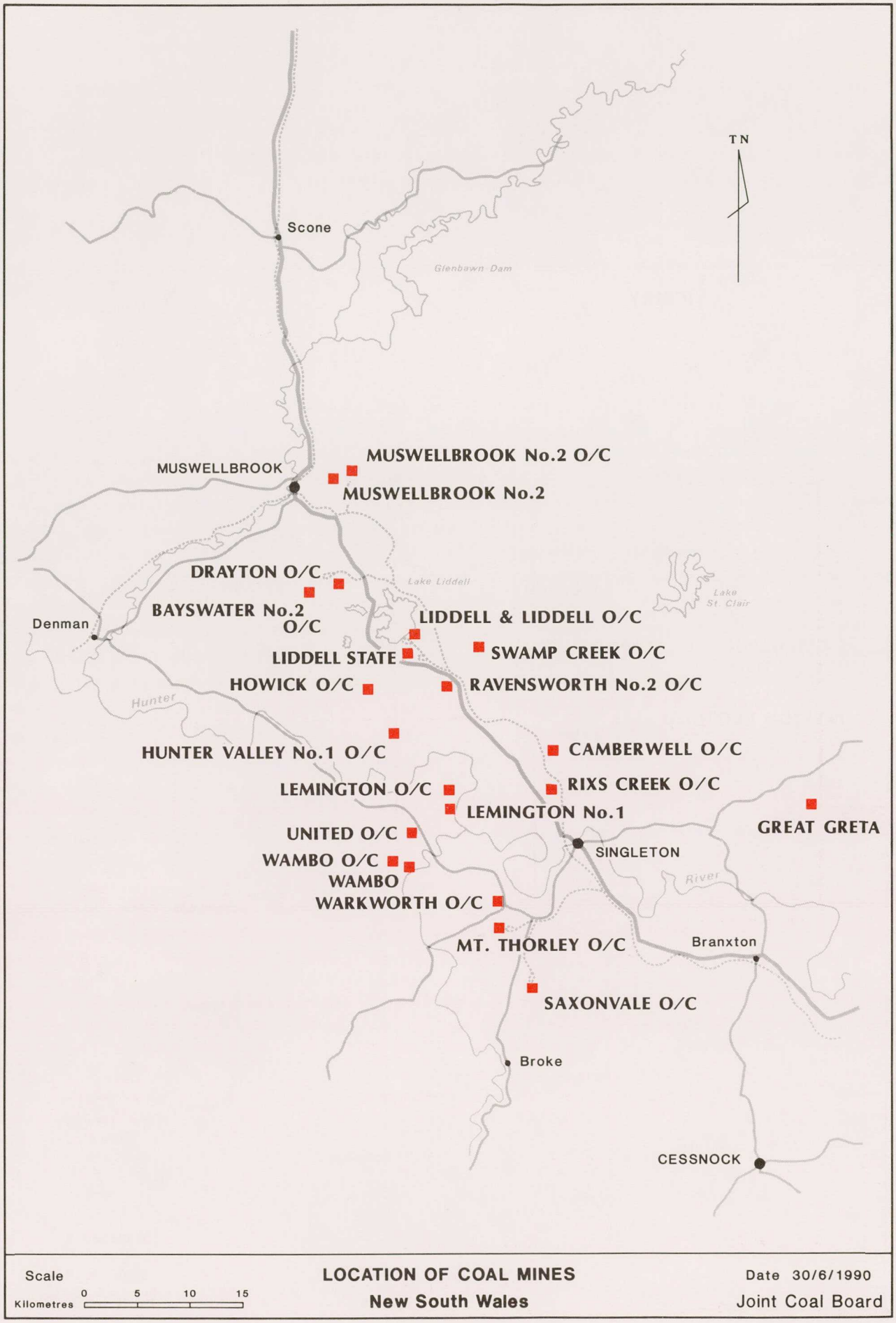
Warkworth No 1 open cut
Location: 15km southwest of Singleton
PO Box 267
Singleton NSW 2330
Phone: (065) 78 9200
Fax: (065) 78 9258
Manager: I Craig

MINE LOCATION MAPS

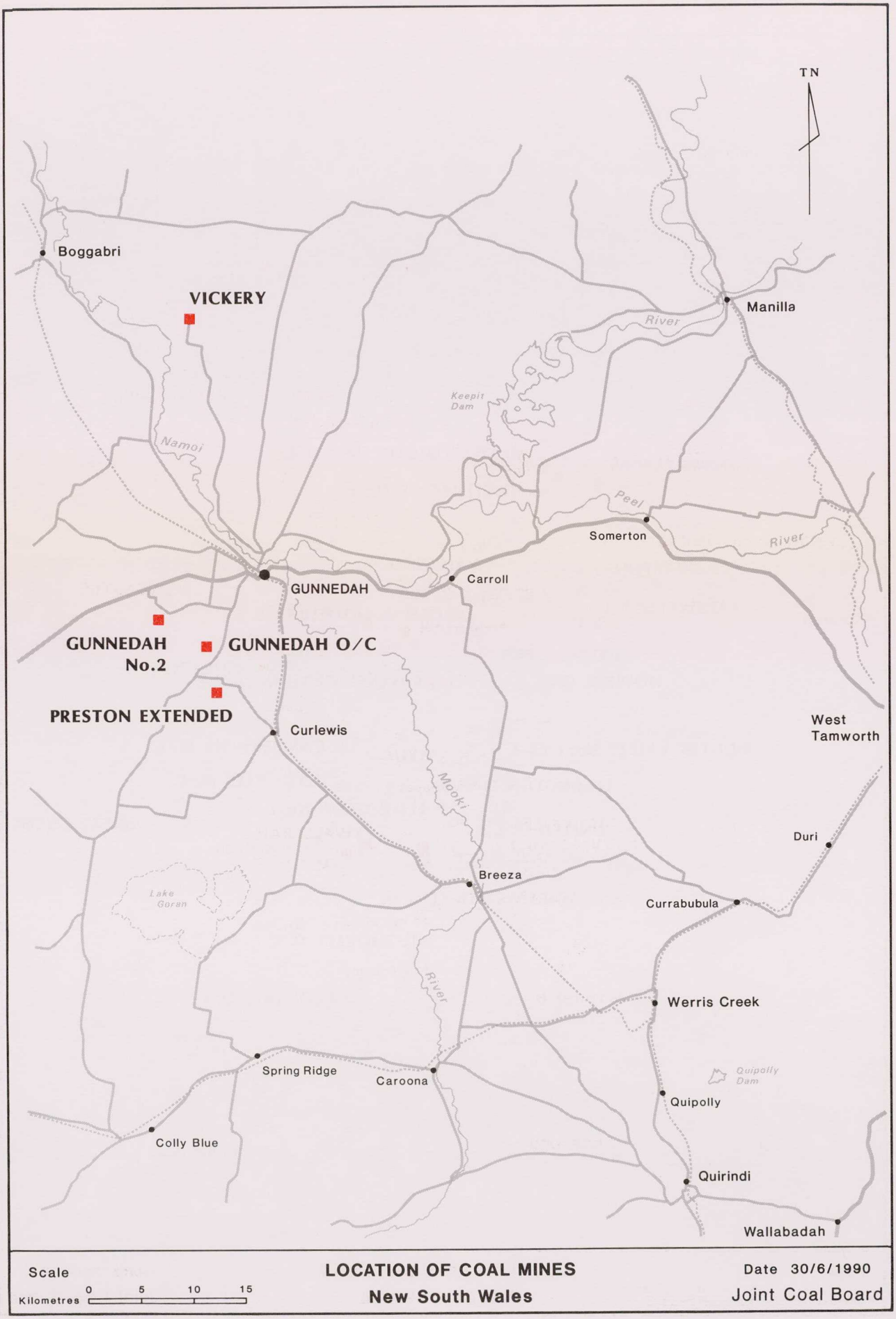
INDEX TO DISTRICT MAPS



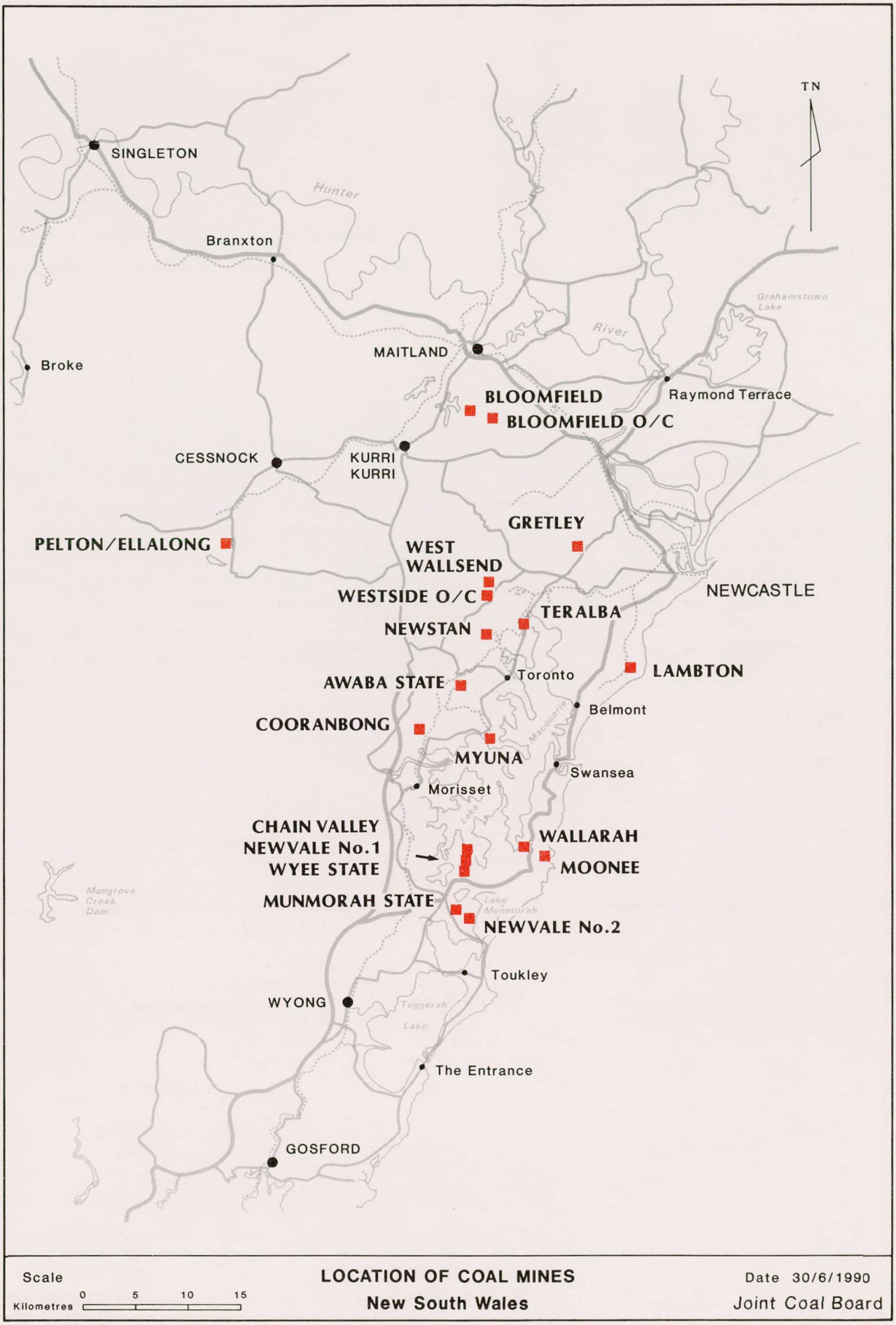
SINGLETON - N.W. DISTRICT (HUNTER)



SINGLETON - N.W. DISTRICT (GUNNEDAH)



NEWCASTLE DISTRICT



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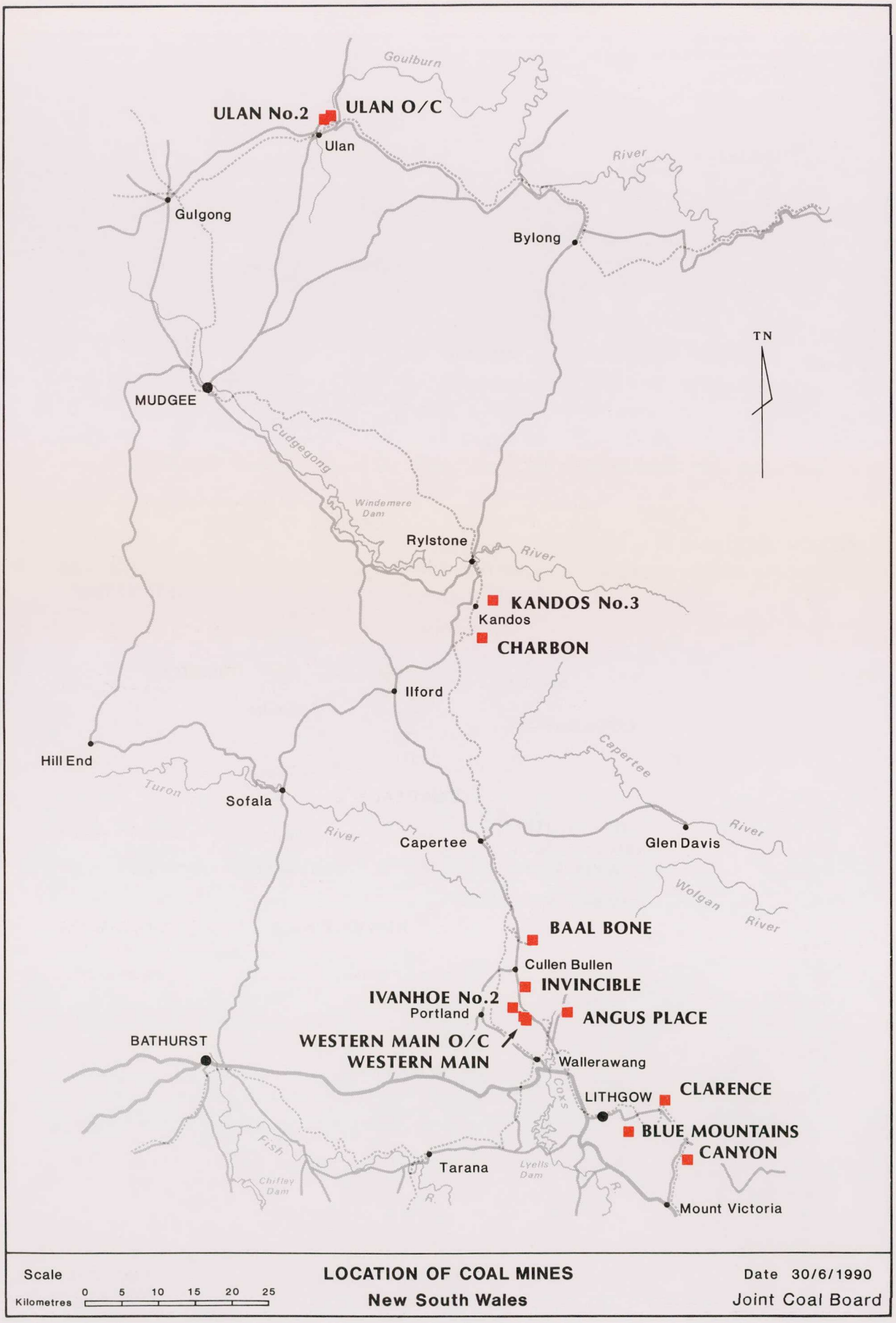
LOCATION OF COAL MINES
New South Wales

Date 30/6/1990
Joint Coal Board

WEST DISTRICT



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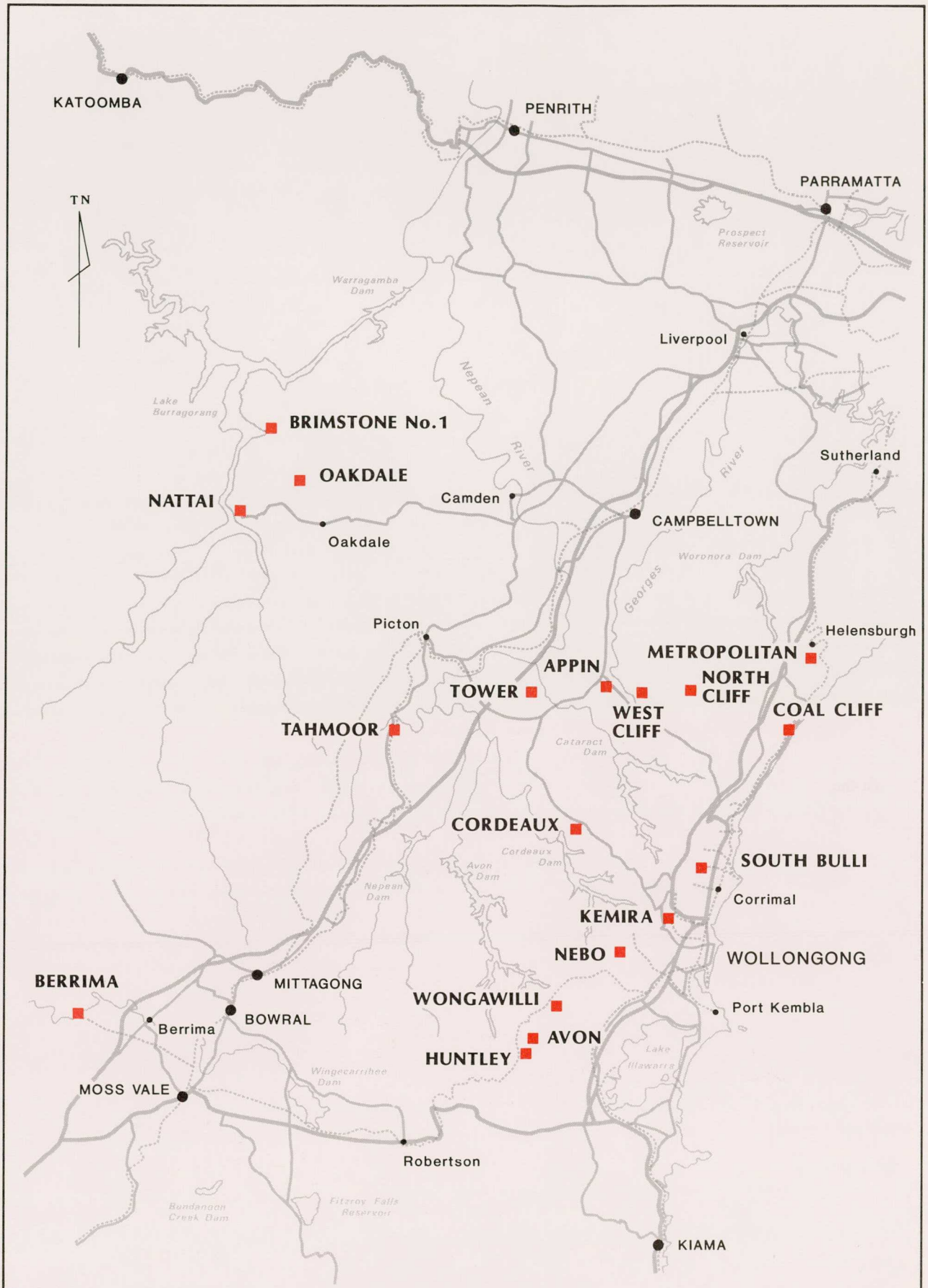
LOCATION OF COAL MINES
New South Wales

Date 30/6/1990
Joint Coal Board

SOUTH DISTRICT



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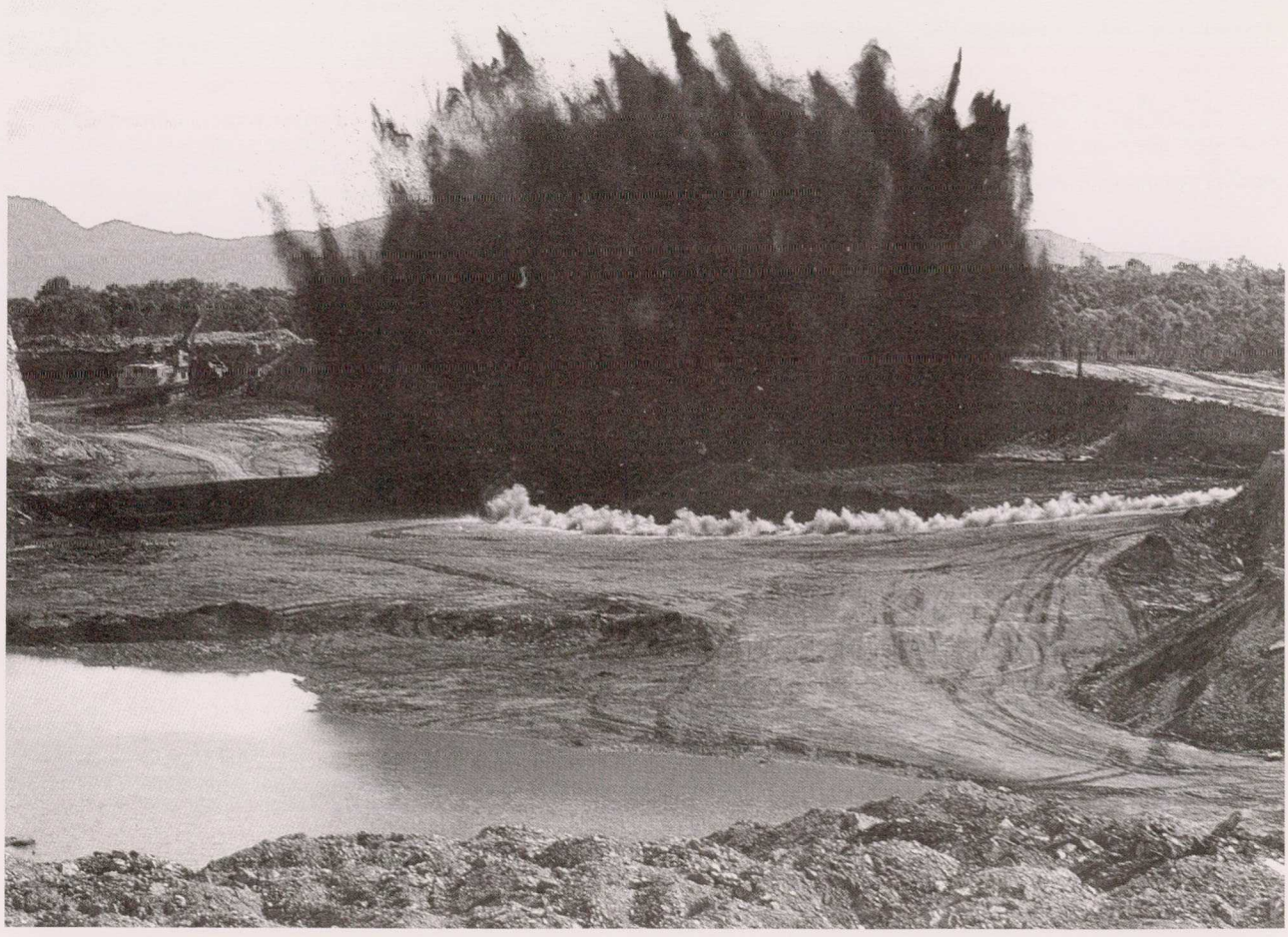
LOCATION OF COAL MINES
New South Wales

Date 30/6/1990
Joint Coal Board

NEW AND POTENTIAL MINES



Blasting coal, Saxonvale mine

BULGA/SAXONVALE

Location: 15km southwest of Singleton

Ownership: Saxonvale Coal Pty Ltd, a wholly-owned subsidiary of Oakbridge Ltd.

Proposal: The company proposes to integrate its existing open cut operation within the Saxonvale coal lease with the adjoining Bulga prospect (Authorisation A219). In 1989-90 the Saxonvale operation had a production of 2.8 Mt raw (2.0 Mt saleable) comprising steaming/PCI coals for export. Coal is rail hauled 90 km to the Port of Newcastle. With the development of the Bulga pit and consolidation with Saxonvale, a total annual production of up to 5.2 Mt raw (3.8 Mt saleable) is planned, comprising soft coking and steaming/PCI coals.

Status: Bulga – Development Application lodged, Environmental Impact Statement completed.

CAMBERWELL

Location: 10km northwest of Singleton

Ownership: Camberwell Coal Pty Ltd, a Joint Venture of Navidale Pty Ltd (a wholly-owned subsidiary of Henry Walker Group Ltd) 50%, Toyota Tsusho Mining (Australia) Pty Ltd 40% and Dia Coal Mining (Australia) Pty Ltd 10%.

Proposal: Camberwell is being developed as a multi-seam open cut operation producing soft coking and steaming coals for export. Coal will be transported by rail (85km) to the Port of Newcastle. Output is scheduled to reach planned full capacity of 2.0 Mt raw (1.35 Mt saleable) per annum within two years of start-up. The mine will be worked by conventional truck and shovel methods.

Status: Construction commenced; regular coal production scheduled to commence in April 1991.

DARTBROOK

Location: Near Aberdeen 11km northwest of Muswellbrook. The prospect area is covered by Authorisation A256.

Ownership: Joint Venture of Austen & Butta Ltd 50% and Shell Australia Ltd 50%.

Proposal: The Dartbrook proposal provides for the development of an underground longwall mine to a maximum production of 2.5/3.0 Mt per annum. Mining will initially concentrate in the Upper Wynn seam providing a low ash, low sulphur, high energy steaming coal for export. Coal will be railed 140km to the Port of Newcastle.

Status: Final planning stage.

GLENNIES CREEK

Location: Glennies Creek is located 12km north of Singleton. The project area comprises Authorisations A44 and A128.

Ownership: Maitland Main Collieries Pty Ltd (a subsidiary of Australian Mining Investments Ltd) in partnership with Toyo Menka Kaisha Ltd and Nippon Oil (Australia) Pty Ltd.

Proposal: The proposal is for a staged underground mine development embodying an expansion of raw coal production over a period of 3-5 years to a maximum of 3.0 Mt per annum. Stage 1 provides for development by continuous miners producing up to 0.55 Mt raw coal (0.40 Mt saleable) per annum. Stage 2 provides for the introduction of longwall mining technology with production increasing to a maximum of 2.5/3.0 Mt raw coal (1.8/2.25 Mt saleable) per annum. The project will provide steaming coal and high-fluidity soft coking coal for export markets.

Status: Development Application lodged; Environmental Impact Statement completed.

HUNTER VALLEY MINE

Location: 17km north of Singleton

Ownership: Coal and Allied Industries Ltd.

Proposal: Coal and Allied is developing an open cut operation on the Hunter Valley No 2 site immediately to the south of its existing Hunter Valley No 1 open cut site. It is proposed to operate the No 2 site as an integral part of the Hunter Valley No 1 operation under a single management structure. Mining at the No 2 site will be by truck and shovel operation utilising existing coal preparation and surface facilities at Hunter Valley No 1 mine. It is proposed that production from the Hunter Valley No 2 site will increase, counter balancing a run-down in production at Hunter Valley No 1 over a period of 15 years. Current annual output (1989-90) from Hunter Valley No 1 is 6.5 Mt raw (4.5 Mt saleable). Maximum annual output of the integrated Hunter Valley operation is expected to be 7.5 Mt raw (5.5 Mt saleable).

Status: under construction.

LIDDELL (DURHAM NORTH)

Location: Liddell colliery holding

Ownership: Liddell Joint Venture (Savage Resources Ltd 61.5%, Marion Mining Pty Ltd 32.5% and Two Cities Pty Ltd 6.0%).

Proposal: The Liddell open cut mine is being developed to supplement production from the Joint Venturers' existing Liddell export underground mine. Production is scheduled to reach 0.5 Mt raw per annum over the expected five year life of the open cut. Mining will be carried out by scrapers, dozers and loaders. Coal from Liddell is rail hauled 107km to the Port of Newcastle.

Status: Construction underway; coal production commenced in July 1990.

MITCHELLS FLAT

Location: 15km northwest of Branxton, 12km northeast of Singleton, Authorisations A17 and A212.

Ownership: Barix Pty Ltd, a wholly-owned subsidiary of FAI Mining Ltd. An associated company Mitchells Flat Coal Co Pty Ltd has been formed to operate the mine.

Proposal: Proposal is for the development of a major new longwall underground mine supplying soft coking and steaming coals to export markets. Stage 1 provides for production of 1.6 Mt raw (1.2 Mt saleable) per annum from year 2 of operation (after a 2-year construction period). During stage 1 it is planned to road haul product coal to Branxton then rail (50km) to Port of Newcastle. The development of stage 2, providing for the introduction of a second longwall unit and increase in production to 3.0 Mt raw (2.4 Mt saleable) per annum would depend on satisfactory mining conditions and adequate markets.

Status: Development Application lodged, Environmental Impact Statement completed.

MT OWEN

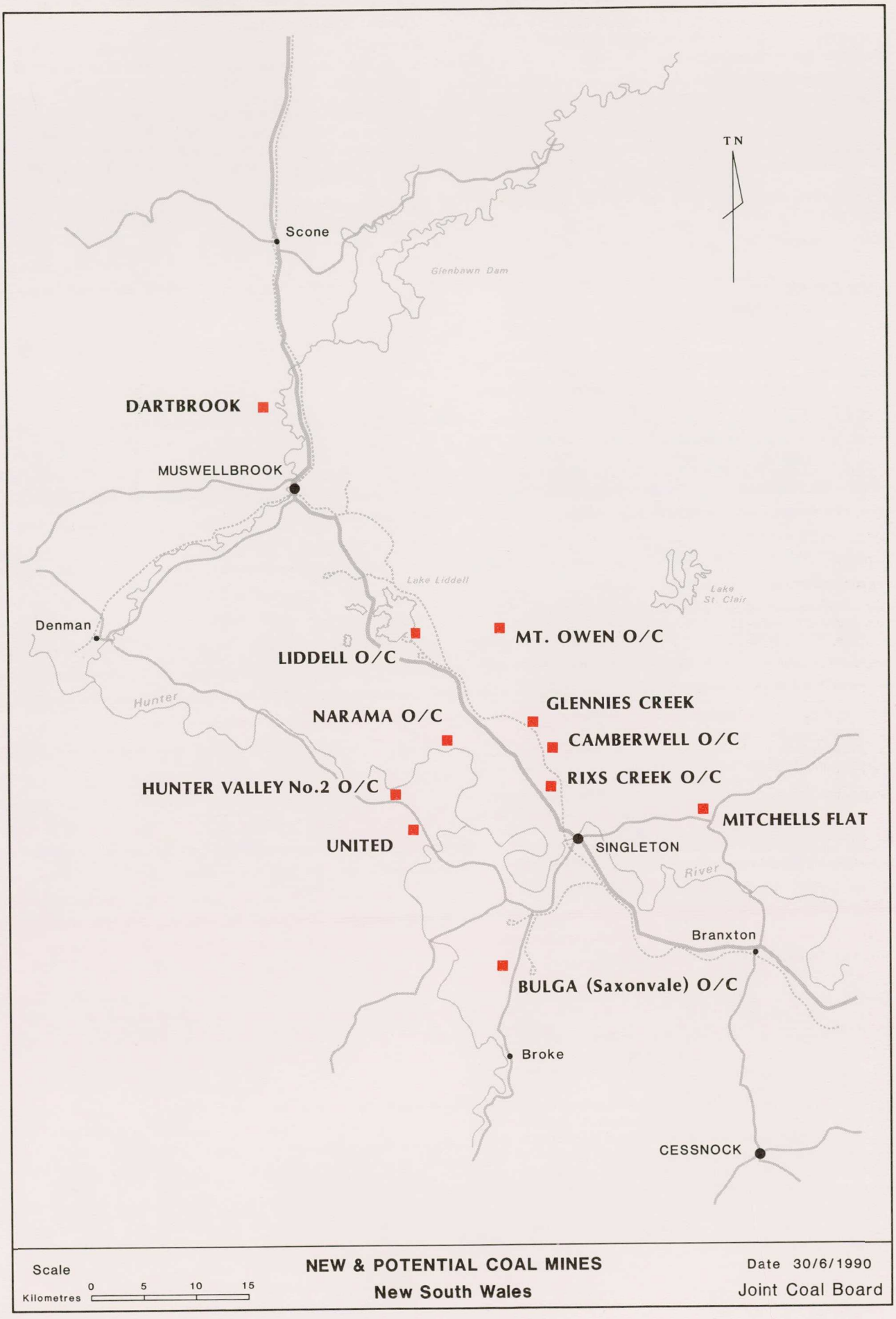
Location: 8km north of Ravensworth, 25km northwest of Singleton, the project area is covered by Authorisations A423 and A429.

Ownership: Hunter Valley Coal Corporation Pty Ltd, jointly owned by B Marheine and J Horseman.

Proposal: Mining proposal provides for the development of an open cut operation supplying soft coking and steaming coals to export markets. Mining will be by front end loaders and trucks on overburden and coal extraction. Saleable coal output is set for 1.0 Mt per annum from year 2 of operation. Product coal (0.7 Mt soft and semi-soft coking and 0.3 Mt steaming) will be loaded out at the Liddell rail loop for dispatch (107km) to the Port of Newcastle.

Status: Development Application and Environmental Impact Statement under preparation.

SINGLETON - N.W. DISTRICT (HUNTER)



NARAMA

Location: 15km northwest of Singleton; Authorisation A290.

Ownership: Joint venture of Costain Australia Ltd and Nardell Colliery Pty Ltd (a wholly-owned subsidiary of Renison Goldfields Consolidated Ltd).

Proposal: The Narama project involves the development of an open cut mining operation for the supply of steaming coal to Bayswater and Liddell power stations. In January 1990 the Narama joint venture was awarded a contract by the Electricity Commission for the supply of 2.0 Mt of coal per annum for a period of 20 years. First deliveries of coal are scheduled to commence in January 1993. Coal deliveries to the power stations will be made via existing coal conveyor system and Ravensworth Washery.

Status: Final planning.

RIX'S CREEK

Location: 3km northwest of Singleton.

Ownership: Bloomfield Collieries Pty Ltd.

Proposal: Stage 1 of the open cut development provides for production of 0.3 Mt raw (0.2 Mt saleable) per annum over a period of 5 years. Mining during this stage will be by scrapers, dozers and loaders. Stage 2 development, providing for production to increase to 1.0 Mt saleable per annum, will be dependent on prevailing market and economic conditions. The low sulphur coal from Rix's Creek will be blended with higher sulphur coals from the Company's existing Bloomfield export mines at East Maitland.

Status: Coal production commenced August 1990.

UNITED

Location: 15km west of Singleton.

Ownership: United Collieries Pty Ltd, a joint venture of United Mineworkers' Federation of Australia 50% and Agip Coal Australia Pty Ltd 50%.

Proposal: A small box cut has been in operation at United since June 1989 as the first stage of the development of a new mine supplying semi-soft coking and steaming coals to export markets. Further development involves the driving of drifts to gain access to underground coal reserves. This is scheduled to be completed in late 1991. Coal production is schedule to increase from 0.15 Mt raw (0.1 Mt saleable) in 1989-90 to 0.75 Mt raw (0.59 Mt saleable) by 1994. At this stage production is expected to be made up of 0.2 Mt raw by open cut methods and 0.55 Mt raw by underground mining. Further development involving the introduction of a longwall unit and construction of a major coal preparation plant will depend on mining experience and the development of markets.

Status: Construction of drifts expected to commence early 1991.

VICKERY/MAULES CREEK

Location: 25km north of Gunnedah.

Ownership: Novacoal Australia Pty Ltd, a wholly-owned subsidiary of CRA Limited.

Proposal: Vickery open cut mine is being developed to reach an output of 1.0 Mt saleable coal per annum over the estimated six-year life of the project. The low sulphur, high energy coal will be sold on export markets. The coal will be rail hauled 320km to the Port of Newcastle. Mining operations will be by pre-strip scrapers, dragline and hydraulic excavators. It is proposed to close the existing Vickery (Red Hill) underground sampling operation when the new open cut is ready for production. The Vickery project is the first phase of a staged development of CRA's Maules Creek coal prospect located to the north of Vickery.

Status: Under construction, coal production scheduled to commence late 1991.

WESTSIDE

Location: 25km southwest of Newcastle; Coal Lease 590.

Ownership: FAI Mining Ltd.

Proposal: FAI is developing an open cut operation to produce up to 0.6 Mt raw coal per annum. The mine will be developed as a contract operation using bulldozers/scrapers on overburden and bulldozers/trucks on coal production. The coal will be transported to FAI's nearby Macquarie coal preparation plant for washing and blending with the Company's other energy coal for export. Contract workforce is expected to be about 20 for a single shift operation, increasing to about 30 for a two shift operation.

Status: Overburden removal scheduled to commence in January 1991; initial coal production scheduled for February 1991.

OPEN CUT MINE SURVEY

Hydraulic excavator, Saxonvale mine

A. OPEN CUT MINES, 1990 SURVEY

	BAYSWATER NO. 2	BLOOMFIELD
Company	Bayswater Colliery Co P/L	Bloomfield Collieries P/L
Coalfield	Hunter	Newcastle
District	Singleton-North West	Newcastle
Seams worked	Brougham, Grasstrees, Thiess, Puxtrees, Balmoral	'A', 'B', 'C', Whites Creek, Elwells Creek, Donaldson, Big Ben
Recoverable reserves		
Raw coal	13.7Mt	52.0Mt
Saleable coal	11.0Mt	31.0Mt
Max depth of cut	70m	65m
Method of working	O/B drilled & blasted & removed by shovels, FE loaders & trucks. Coal ripped by dozers or drilled & blasted & removed by FE loaders & trucks	O/B drilled & blasted, removed by dragline, shovel & trucks. Coal ripped by dozer & removed by FE loader
Production schedule (weekly)		
Overburden	3 x 8hr shifts, 5 days	3 x 7hr shifts, 5 days (dragline)(a)
Coal	3 x 8hr shifts, 5 days	2 x 7hr shifts, 5 days
Days worked, 1989-90		
Overburden/coal	217/217	233/189
Mine output, 1989-90		
Overburden (bank)	6 200 000m^3	7 630 100m^3
Raw coal	1 453 500t	1 579 900t
Saleable coal	1 430 800t	936 600t
O/B to coal ratio, 1989-90		
Raw coal	4.3m^3/t	4.8m^3/t
Saleable coal	4.3m^3/t	8.1m^3/t
Washery		
Operation (weekly)	3 x 8hr shifts, 5 days	(see U/G mine)
Input capacity	310tph	(see U/G mine)
Mine employment, June 1990		
Mine	202	58
Washery	18	(see U/G mine)
Total	220	58
Products	Export steaming & semi-soft coking, domestic steaming	Export steaming, soft & semi-soft coking
Transport	Export coal by road/rail (125km) to Newcastle; domestic coal by conveyor to Liddell & Bayswater power stations	By road to Thornton Siding then rail (30km) to Newcastle
Overburden & coal equipment	1 x Gardener Denver 25C drill 2 x BE 45R drills 1 x P&H 2800 25m^3 shovel 1 x P&H 2300 17.5m^3 shovel 1 x Hough 580 15m^3 FE loader 1 x Caterpillar 988B 11.5m^3 FE loader 2 x Caterpillar 992C 17m^3 FE loaders 4 x Caterpillar 992C 11m^3 FE loaders 2 x Caterpillar 992C/988B dozers 3 x Caterpillar D11/D10 dozers 4 x Euclid R120 109t trucks 8 x Euclid R85 77t trucks 12 x Euclid R170 154t trucks	1 x BE 45R drill 1 x BE 30R drill 1 x P&H 2355 20m^3 dragline 1 x P&H 5700 46m^3 shovel 1 x Caterpillar 992 8m^3 FE loader 1 x Caterpillar 992C 13m^3 FE loader 1 x Caterpillar 988B 12.5m^3 FE loader 2 x Caterpillar 660B scraper 2 x Caterpillar 666B scraper 5 x Caterpillar D9/10/11 dozers 5 x Caterpillar 789 trucks 7 x highway type trucks

(a) Shovel – 2 x 7hr shifts, 5 days

DRAYTON	GUNNEDAH	HOWICK
Drayton Coal P/L Hunter Singleton-North West	Gunnedah Coal Co Ltd Gunnedah Singleton-North West	Novacoal Australia P/L Hunter Singleton-North West
Brougham, Grasstrees, Thiess Puxtrees, Balmoral	Melville	Arties, Liddell, Barrett
76.0Mt 76.0Mt 94m	4.5Mt 3.4Mt 40m	153.0Mt 107.0Mt 75m
Main O/B removed by dragline with pre-strip of upper seams by shovel & trucks. Partings removed by FE loaders, backhoe, & trucks. Coal extracted by FE loaders & trucks	Upper O/B removed by scrapers & dozers; lower O/B drilled & blasted & removed by FE loaders & trucks; partings & coal ripped by dozer & removed by FE loaders & trucks	Main O/B removed by dragline with pre-stripping by shovel & trucks. Coal extracted by FE loaders & trucks
3 x 8.5 hr shifts, 7 days (dragline)(a) 3 x 8hr shifts, 5 days 324/216	2 x 8hr shifts, 9 day f/night 2 x 8hr shifts, 9 day f/night 205/205	Continuous roster, 7 days 3 x 8hr shifts, 5 days 303/239
13 090 000m³ 3 527 400t 3 527 400t 3.7m³/t 3.7m³/t	2 050 000m³ 546 600t 420 300t 3.8m³/t 4.9m³/t	23 926 000m³ 3 739 800t 2 822 200t 6.4m³/t 8.5m³/t
– –	(see U/G mine) (see U/G mine)	3 x 8hr shifts, 5 days 1200tph(a)
540 – 540	54 (see U/G mine) 54	375 80(a) 455
Export & domestic steaming Export coal railed (100km) to Newcastle; domestic coal by conveyor to Liddell & Bayswater power stations	Export steaming & semi-soft coking Rail (320km) to Newcastle	Export steaming, soft & semi-soft coking; domestic steaming Export coal railed (110km) to Newcastle; domestic coal by conveyor to Liddell & Bayswater power stations
1 x Gardner Denver 70 270mm drill 1 x Ingersoll Rand 25 125mm drill 1 x Marion M3 270mm drill 1 x Bucyrus Erie 1370W 48m³ dragline 1 x P&H 2800II 25m³ shovel 1 x P&H 2800XP 27.5m³ shovel 1 x Demag 285 15m³ excavator 6 x Caterpillar 992C 12.5m³ FE loaders 1 x Le Tourneau L1100 15m³ FE loader 4 x Caterpillar D11 dozers 1 x Caterpillar D9 dozer 3 x Caterpillar D10 dozers 3 x Komatsu 475 dozers 1 x Caterpillar 637D scraper 2 x Unit Rig Lectra Haul 172t trucks 9 x Caterpillar 785 136t trucks 11 x Komatsu HD 1200m 120t trucks 18 x Wabco 154t trucks	2 x Caterpillar 992C 9m³ FE loaders 1 x Caterpillar D9L dozer 1 x Caterpillar D10 dozer 3 x Caterpillar 657B 25m³ scrapers 5 x Caterpillar 777B 77t trucks	1 x Mole coal drill 2 x Ingersoll Rand DMH 310mm drills 1 x Bucyrus Erie 1570 53m³ dragline 1 x Marion M7900 31m³ dragline 1 x Bucyrus Erie 395 29m³ shovel 1 x Komatsu WA800 10m³ FE loader 1 x Le Torneau L1100 FE loader 2 x Caterpillar 992C FE loaders 2 x Komatsu D475A dozers 3 x Caterpillar 777 77t trucks 9 x Euclid R170 154t trucks 14 x 30t trucks

(a) Other overburden operations – 3 x 8hr shifts, 5days

(a) Howick & Newdell

A. OPEN CUT MINES, 1990 SURVEY

	HUNTER VALLEY NO.1	LEMINGTON
Company	Coal & Allied Industries Ltd	Lemington Coal Mines Ltd
Coalfield	Hunter	Hunter
District	Singleton-North West	Singleton-North West
Seams worked	Vaux, Piercefield, Mount Arthur	Mount Arthur, Piercefield
Recoverable reserves		
Raw coal	43.6Mt	47.3Mt
Saleable coal	31.9Mt	35.7Mt
Max depth of cut	45m	90m
Method of working	O/B removed mainly by truck & shovel operation. Coal & interburden removed by truck & loader operation	O/B drilled & blasted & removed by shovels, FE loaders & trucks. Coal extracted by FE loaders & trucks
Production schedule (weekly)		
Overburden	3 x 8.5hr shifts, 7 days	3 x 8hr shifts, 5 days
Coal	3 x 8hr shifts, 6 days	3 x 8hr shifts, 5 days
Days worked, 1989-90		
Overburden/coal	299/259	257/248
Mine output, 1989-90		
Overburden (bank)	12 857 200m^3	7 990 000m^3
Raw coal	6 407 300t	1 731 900t
Saleable coal	4 540 600t	1 233 400t
O/B to coal ratio, 1989-90		
Raw coal	2.0m^3/t	4.6m^3/t
Saleable coal	2.8m^3/t	6.5m^3/t
Washery		
Operation (weekly)	3 x 8.5hr shifts, 7days	3 x 8hr shifts, 9 day f/night(a)
Input capacity	950tph	650tph
Mine employment, June 1990		
Mine	524	208
Washery	154	51
Total	678	259
Products	Export steaming & soft coking	Export steaming & soft coking
Transport	Rail (107km) to Newcastle	By road to Mt Thorley coal loader then by rail (85km) to Newcastle
Overburden & coal equipment	2 x Driltech 40k drills 2 x Driltech 60k drills 2 x P&H 2800XP 26.7m^3 shovels 3 x Dresser Hough 580 16.8m^3 payloaders 4 x Caterpillar 992C 9m^3 FE loaders 2 x Caterpillar 992C 14m^3 FE loaders 4 x Caterpillar 657E 21m^3 scrapers 1 x Caterpillar T690 dozer 2 x Caterpillar 824C dozers 2 x Caterpillar D9L dozers 2 x Caterpillar D10 dozers 5 x Komatsu 475 dozers 2 x Hough 970 dozers 3 x Caterpillar 777 92t trucks 8 x Euclid R190 172t trucks 9 x Caterpillar 777 77t trucks 10 x Wabco 120cm 109t trucks 6 x Caterpillar 776 120t haulers	1 x Marion M3 drill 1 x Driltech 40k drill 1 x P&H 2800 23m^3 shovel 1 x Marion 204M 26m^3 shovel 1 x Michigan 475TC 11.5m^3 FE loader 6 x Caterpillar 992C 9m^3 FE loaders 1 x Caterpillar 824C dozer 2 x Caterpillar 834C dozers 1 x Caterpillar D10 dozer 3 x Unit Rig MT 4000 215t trucks 5 x Unit Rig M36 Lectra Haul 154t trucks 10 x Komatsu HD 1600 160t trucks

(a) Washery also serves Lemington underground mine

LIDDELL	MOUNT THORLEY	MUSWELLBROOK NO. 2
Liddell Joint Venture Hunter Singleton-North West	Coal & Allied Industries Ltd Hunter Singleton-North West	Muswellbrook Coal Co Ltd Hunter Singleton-North West
Liddell, Barrett	Redbank Creek, Wambo, Whynot, Blakefield, Glen Munro, Woodlands Hill	Fleming, Hallett, Muswellbrook, St Heliers, Lewis
2.6Mt 2.0Mt 22m	72.7Mt 55.2Mt 117m	27.0Mt 26.3Mt 140m
O/B removed by dozer/scraper & FE loader/trucks; coal removed by FE loader/trucks	O/B removed by two shovels & truck fleets and then dragline; interburden removed by shovels & trucks. Coal removed by FE loaders and bellydumpers	O/B drilled & blasted & removed by shovel & trucks. Coal & partings removed by FE loaders & trucks
1 x 8hr shift, 9 day f/night 1 x 8hr shift, 9 day f/night 9/ – (a) 45 000(a) – (a) – (a) – (a) – (a)	3 x 8.5hr shifts, 7 days 3 x 8.5hr shifts, 6 days 290/254 19 703 800m³ 4 926 700t 3 598 300t 4.0m³/t 5.5m³/t	3 x 8hr shifts, 6 days 2 x 8hr shifts, 5 days 272/227 4 997 600m³ 1 130 300t 1 088 200t 4.4m³/t 4.6m³/t
(see U/G mine) (see U/G mine)	3 x 8.5hr shifts, 7 days 1200tph	1 x 8hr shift, 5 days 300tph
25 (see U/G mine) 25	557 111 668	156 (from mine employees) 156
Export soft coking & steaming coals By rail (107km) to Newcastle	Export steaming, soft & semi-soft coking Conveyor to Mt Thorley coal loader then rail (85km) to Newcastle	Export steaming & semi-soft coking; domestic steaming Export coal by road (125km) to Newcastle; domestic coal by road to Bayswater & Liddell power stations
5 x Caterpillar 660 scrapers 3 x Caterpillar D10 dozers 1 x Caterpillar 980 FE loader	1 x BE 45R drill 1 x Gardner Denver 25C drill 1 x Gardner Denver 35C drill 2 x Gardner Denver 70 drills 1 x Marion 8200 55m³ dragline 1 x Bucyrus Erie 295B1 20.5m³ shovel 1 x P&H 2800XP 27m³ shovel 1 x Caterpillar 992C 14m³ FE loader 3 x International 580 20.5m³ FE loaders 2 x Caterpillar D10 dozers 2 x Caterpillar D11 dozers 2 x Caterpillar 834B dozers 4 x Caterpillar D9L dozers 3 x Caterpillar 657E scrapers 1 x Massey Ferguson AG tractor 5 x Euclid CH150 136t trucks 8 x Euclid R170 154t trucks 3 x Euclid R100 91t trucks 11 x Euclid R190 172t trucks 10 x Dresser 830E 218t trucks	1 x Gardner Denver 25C 170mm drill 1 x Ingersoll Rand DMM 270mm drill 1 x P&H 2800 25m³ shovel 1 x Caterpillar 988B 11m³FE loader 2 x Caterpillar 992C 9m³ FE loaders 1 x Caterpillar 992C 13m³ 1 x Hough 580 15m³ FE loader 3 x Caterpillar D10 dozers 2 x Caterpillar 785 135t trucks 2 x Caterpillar 789 trucks 4 x Euclid R170 154t trucks 3 x Euclid R85 77t trucks 2 x Dresser 510E trucks

(a) O/B removal commenced June 1990
Coal production commenced July 1990

A. OPEN CUT MINES, 1990 SURVEY

	RAVENSWORTH	SAXONVALE
Company	Costain Australia Ltd	Saxonvale Coal P/L
Coalfield	Hunter	Hunter
District	Singleton-North West	Singleton-North West
Seams worked	Ravensworth, Bayswater, Vaux	Whynot, Blakefield, Glen Munro Woodlands Hill, Mount Arthur, Piercefield, Vaux, Whybrow
Recoverable reserves		
Raw coal	41.7Mt	395.0Mt
Saleable coal	41.7Mt	296.0Mt
Max depth of cut	70m	100m
Method of working	O/B removed by dragline with prestripping by shovel & truck. Coal extracted by truck & shovel operation	O/B drilled & blasted & removed by shovels & trucks. Coal ripped by dozers & removed by FE loaders & trucks
Production schedule (weekly)		
Overburden	3 x 8.5hr shifts, 7 days (a)	3 x 8.5hr shifts, 7 days
Coal	3 x 8hr shifts, 5 days	3 x 8hr shifts, 6 days
Days worked, 1989-90		
Overburden/coal	363/250	290/240
Mine output, 1989-90		
Overburden (bank)	26 441 200m^3	7 373 600m^3
Raw coal	4 285 200t	2 810 900t
Saleable coal	4 060 100t	1 932 000t
O/B to coal ratio, 1989-90		
Raw coal	6.2m^3/t	2.6m^3/t
Saleable coal	6.5m^3/t	3.8m^3/t
Washery		
Operation (weekly)	Coal washed at Electricity Commission's	3 x 8hr shifts, 6 days
Input capacity	Ravensworth Washery	650tph
Mine employment, June 1990		
Mine	429	301
Washery	–	65
Total	429	366
Products	Domestic steaming	Export steaming
Transport	Conveyor to Bayswater & Liddell power stations	Rail (90km) to Newcastle
Overburden & coal equipment	2 x BE 49R drills 1 x BE 45R drill 1 x BE 60R drill 2 x Reed SK40 drills 2 x Bucyrus Erie 1370KW 49m^3 draglines 1 x Bucyrus Erie 295B1 21m^3 shovel 1 x P&H 2300XP 21m^3 shovel 2 x P&H 1900AL 15m^3 shovels 1 x Le Tourneau L1000 15m^3 FE loader 1 x Le Tourneau L1100 17m^3 FE loader 2 x Caterpillar 992C 14m^3 FE loaders 2 x Euclid R130 118t trucks 6 x Euclid R170 154t trucks 13 x Euclid R120E 109t trucks	1 x Drilltech D75R 270mm drill 1 x Gardner Denver 25C 187mm drill 2 x BE 55R 270mm drills 1 x P&H 2300 19m^3 shovel 2 x P&H 2300 17.5m^3 shovels 1 x Demag 485 24m^3 excavator 4 x Caterpillar 992C 9m^3 FE loaders 1 x Caterpillar D9L dozer 2 x Caterpillar 988B dozers 3 x Caterpillar D10N dozers 4 x Komatsu 375 dozers 5 x Titan 33-15B 154t trucks 3 x Wabco 77t trucks 5 x Dresser 685E 180t trucks 10 x Titan 33-15C 172t trucks

(a) Prestrip – 3 x 8hr shifts, 5 days

SWAMP CREEK	ULAN	UNITED
Hebden Mining Co Hunter Singleton-North West	Ulan Coal Mines Ltd West West	United Collieries P/L Hunter Singleton-North West
Ravensworth, Bayswater	Ulan	Wambo
1.25Mt 1.25Mt 80m	131.0Mt 71.4Mt 65m	n.a. n.a. 12m
O/B drilled & blasted & removed by dragline, shovel, excavator & trucks. Coal removed by shovel, FE loaders & trucks	Main O/B removed by dragline with pre-shipping by shovel & trucks. Coal extracted by shovel, in-pit crusher & conveyors	O/B drilled & blasted, removed by scraper, FE loader & trucks; coal extracted by FE loader & trucks
3 x 8hr shifts, 5 days 3 x 8hr shifts, 5 days 260/260 4 490 000m³ 1 889 600t 1 777 600t 2.4m³/t 2.5m³/t	3 x 8.5hr shifts, 7 days 3 x 8.5hr shifts, 5 days 358/214 13 537 300m³ 4 471 700t 2 451 600t 3.0m³/t 5.5m³/t	1 x 8hr shifts, 11 day f/night 1 x 8hr shifts, 11 day f/night 146 400t 103 900t n.a. n.a.
Coal washed at Electricity Commission's Ravensworth Washery	3 x 8.5hr shifts, 5 days 1 200tph	– –
126 – 126	279 32 311	30 – 30
Domestic steaming	Export steaming	Export semi-soft coking & steaming
Conveyor to Liddell & Bayswater power stations	Rail (279 km) to Newcastle	By road to MTCL then rail (85km) to Newcastle
1 x Driltech 75K 270mm drill 4 x Atlas Copco 2202 228mm drills 1 x Marion 7700 19m³ dragline 1 x Bucyrus Erie 395 26m³ shovel 1 x Marion 151M 10m³ shovel 1 x Demag 285 14m³ excavator 2 x Caterpillar 992C 10m³ FE loaders 4 x Caterpillar 785 135t trucks 7 x Euclid R85 77t trucks	1 x Reed SK60 280mm drill 1 x Gardner Denver 100 311mm drill 1 x Ingersoll Rand DM25SP 160mm drill 1 x Marion 8050 46m³ dragline 1 x P&H 2300LR 26m³ shovel 1 x Marion 204M 24.5m³ shovel 2 x Caterpillar 992C FE loaders 4 x Unit Rig Lectra Haul 170t trucks 3 x Komatsu 120t trucks 1 x O&K in-pit crusher 2100tph 1 x O&K bandwaggon 2700tph 20 x Matthew Hall belt modules 2100tph 2 x Scheuerle 70t transporters	1 x Ingersoll drill 1 Caterpillar 992C 10m³ FE loader 1 x 7m³ FE loader 1 x Caterpillar D11N dozer 2 x Caterpillar D10 dozers 1 x Komatsu D455A dozer 2 x Caterpillar 657B scrapers 4 x Caterpillar 666 scrapers 2 x Caterpillar 777 77t trucks

A. OPEN CUT MINES, 1990 SURVEY

	WAMBO	WARKWORTH
Company	Wambo Mining Corp P/L	Warkworth Mining Ltd
Coalfield	Hunter	Hunter
District	Singleton-North West	Singleton-North West
Seams worked	Wambo	Woodlands Hill, Arrowfield, Bowfield, Warkworth, Mount Arthur, Piercefield, Vaux, Broonie
Recoverable reserves		
Raw coal	4.5Mt	76.5Mt
Saleable coal	3.5Mt	52.5Mt
Max depth of cut	24m	
Method of working	O/B & coal removed by FE loader & trucks	O/B drilled & blasted with pre-strip shovels & trucks working in advance of dragline. Coal extracted by FE loaders & trucks
Production schedule (weekly)		
Overburden	1 x 8hr shift, Mon-Fri	3 x 8.5hr shifts 7 days
Coal	1 x 8hr shift, Mon-Fri	3 x 8hr shifts 5 days
Days worked, 1989-90		
Overburden/coal		344/234
Mine output, 1989-90		
Overburden (bank)		14 820 200m^3
Raw coal	504 900t	3 511 200t
Saleable coal	339 600t	2 457 100t
O/B to coal ratio, 1989-90		
Raw coal	5.2m^3/t	4.2m^3/t
Saleable coal	6.5m^3/t	6.0m^3/t
Washery		
Operation (weekly)	(see U/G mine)	3 x 8.5hr shifts 7 days
Input capacity	(see U/G mine)	700tph
Mine employment, June 1990		
Mine	50	378
Washery	(see U/G mine)	62
Total	50	440
Products	Export steaming & semi-soft coking	Export steaming, soft & semi-soft coking
Transport	By road to MTCL then by rail (85km) to Newcastle	Export coal by conveyor to Mt Thorley coal loader then by rail (85km) to Newcastle
Overburden & coal equipment	3 x Caterpillar 992C 10m^3 FE loaders 2 x Caterpillar D10 dozers 2 x Caterpillar D9H dozers 2 x Caterpillar 777 77t trucks 2 x Euclid R85 77t trucks	2 x Gardner Denver 100 311mm drills 2 x Gardner Denver 25C 187mm drills 1 x Bucyrus Erie 1370W 46m^3 dragline 2 x Bucyrus Erie 295BII 20m^3 shovels 2 x Le Tourneau L1100 15m^3 FE loaders 4 x Caterpillar D9 dozers 2 x Caterpillar D10 dozers 1 x Caterpillar D11N dozer 2 x Caterpillar 992C 10m^3 FE loaders 10 x Caterpillar 785 135t trucks 14 x Unit Rig MK36 Lectra Haul 154t trucks

WESTERN MAIN		
Novacoal Australia P/L West West		
Irondale, Lidsdale, Lithgow		
1.0Mt 0.9Mt 22m		
O/B removed by scraper & dozer. Coal extracted by dozer & FE loader		
} 1 x 10hr shift, 5 days 228 475 000m³ 127 900t 112 000t 3.7m³/t 4.2m³/t		
(see U/G mine) (see U/G mine)		
6 (see U/G mine) 6		
Export & domestic steaming Export coal by rail to Port Kembla (257km) or Balmain (176km). Domestic coal by road to various consumers		
1 x Caterpillar 983 transcavator 1 x Caterpillar 988B FE loader 1 x Caterpillar D10 dozer 1 x Caterpillar D11N dozer 1 x Caterpillar 657B scraper		

LONGWALL MINE SURVEY

Longwall face, Angus Place colliery

B. LONGWALL MINES, 1990 SURVEY

	ANGUS PLACE	APPIN
Company	Newcom Collieries Pty Ltd	BHP Co Ltd
Coalfield/district	West/West	South/South
Seam (thickness)	Lithgow (5.0m)	Bulli (2.5m)
Recoverable reserves	46Mt raw & saleable	48Mt raw
Longwall operation (weekly)	4 x 7hr shifts, 5 days	4 x 7hr shifts, 6 days
Raw output, 1989-90		
Longwall face	1 101 700t	1 868 000t
Other	177 100t	403 800t
Total	1 278 800t	2 271 800t
Saleable output, 1989-90	1 278 800t	2 250 200t
Washery		
Operation (weekly)	–	(washed at steelworks)
Input capacity	–	–
Employment June 1990		
Below ground	221	341
Surface	116	93
Total mine	317	434
Washery	–	–
Total mine/washery	317	434
Output per employee, 1989-90		
Raw coal	4 060t	5 151t
Saleable coal	4 060t	5 102t
Commenced longwall mining	August 1979	May 1969
Longwall block dimensions		
Width	200m	196m
Length	1 150m	1 200m
Seam/depth of cover	Lithgow 230-270m	Bulli, 450-550m
Shearer		
Manufacturer	Anderson Strathclyde	Eickhoff
Type	AM500 DERDS	DERDS, EDW-200L
Drum diameter	1.6m	1.8m
Cutting height/method	2.7m, Bi-Di	2.45m, Uni-Di
Kw/voltage	375kw/1 100v	200Kw/1 100v
Roof Support		
Manufacturer	Dowty	Westfalia
Type	4-leg Chock Shield	4-leg Chock Shield
Yield load	650t	700t
Face conveyor (AFC)		
Manufacturer	Dowty Meco	Dowty
Width/chain size	839mm/30mm	930mm/twin 30mm
Kw	600kw total	2 x 373kw
Stage loader	Dowty	Westfalia
Coal crusher	MMD	Klockner Becorit
Coal clearance (to surface)		
Type	Conveyor	Conveyor
Capacity	1 200tph	1 000tph
Other face equipment	1 x Lee Norse 60H C/Miner 4 x Jeffrey 120H2 C/Miners 6 x Noyes 1560 Hydrocars	1 x Alpine Miner 6 x Joy 10CM C/Miners 12 x Joy 22SC S/Cars
Product	Domestic steaming	Domestic coking
Transport	By private road to Wallerawang power station	By road to O'Brien's Drift then rail to Port Kembla steelworks

BAAL BONE	BRIMSTONE	CORDEAUX
Coalex Pty Ltd	Clutha Ltd	BHP Co Ltd
West/West	South/South	South/South
Lithgow (2.1–2.9m)	Bulli (1.8 – 2.5m)	Bulli (2.2m)
56Mt raw, 45.7Mt saleable	23.5Mt raw, 18.1Mt saleable	61Mt raw
4 x 7hr shifts, 6 days	3 x 9hr shifts, 6 days	4 x 7hr shifts, 6 days
1 695 200t 204 800t 1 900 000t 1 593 600t	246 900t(a) 827 300t 1 074 300t 856 100t	2 120 900t 394 500t 2 515 500t 2 482 700t
3 x 7hr shifts, 6 days 700tph	(see Nattai) (see Nattai)	(washed at steelworks) –
198 49 247 38 285	177 27 204 (see Nattai) 204	329 90 419 – 419
6 714t 5 631t	5 372t 4 280t	6 047t 5 968t
December 1985	March 1990	January 1986
200m 1 940m Lithgow, 70-180m	89m 1 140m Bulli, 390-420m	150m 3 200m Bulli, 400m
Eickhoff DERDS, EDW-300/380-L 1.8m 2.4m, Uni-Di 375kw/3 300v	Colmil SNDR 1.8m 2.1, Bi-Di 200kw/1 100v	Mitsui Miike DERDS 1.8m 2.5m, Uni-Di 350kw/1 100v
Gullick Dobson 4-Leg Chock Shield 630t Gullick 950mm/30mm 2 x 375kw	Fazos 2-Leg Chock Shield 530t Ryafama 842mm/30mm 250kw	Dowty Meco 4-Leg Chock Shield 750t Dowty Meco 764mm/29mm (twin centre) 450kw
Mining Supplies Mining Supplies Conveyor 2 200tph	Ryafama Kruk Conveyor 1 200tph	Dowty 1064 Dowty Conveyor/shaft 1 500tph/600tph
2 x Joy 12CM20 C/Miners 2 x Jeffrey 120H2 C/Miners 6 x Joy 15SC S/Cars	3 x Joy 12CM C/Miners 6 x Joy 15SC S/Cars	1 x Paurat E230 Road Header 5 x Joy 12CM5 C/Miners 10 x Joy 22SC S/Cars 1 x Klockner Becorit Continuous Haulage System
Export & domestic steaming	Export coking and steaming	Domestic coking
Export coal by rail to Balmain (144km) or Port Kembla (227km); domestic coal by road (various)	Rail (165km) or road (70km) to Port Kembla, rail (85km) to Balmain	By road to O'Brien's Drift then rail to Port Kembla steelworks

(a) Longwall commenced March 1990

B. LONGWALL MINES, 1990 SURVEY

	GRETLEY	KEMIRA
Company	Newcastle Wallsend Coal Co Pty Ltd	BHP Co Ltd
Coalfield/district	Newcastle/Newcastle	South/South
Seam (thickness)	Dudley (2.1-2.3m)	Wongawilli (9.0m)
Recoverable reserves	28Mt raw, 16Mt saleable	n.a.
Longwall operation (weekly)	3 x 8hr shifts, 9 day f/night (a)	3 x 7hr shifts, 6 days
Raw output, 1989-90		
Longwall face	634 800t	764 900t
Other	405 600t	193 900t
Total	1 040 500t	958 800t
Saleable output, 1989-90	582 500t	958 800t
Washery		
Operation (weekly)	2 x 8hr shifts, Mon-Fri	(washed at steelworks)
Input capacity	450tph	–
Employment June 1990		
Below ground	203	192
Surface	41	60
Total mine	244	252
Washery	18	–
Total mine/washery	262	252
Output per employee, 1989-90		
Raw coal	3 971t	4 029t
Saleable coal	2 223t	4 029t
Commenced longwall mining	June 1988	August 1988
Longwall block dimensions		
Width	32m	100m
Length	2 000m	1 530m
Seam/depth of cover	Dudley, 70-90m	Wongawilli, 155-255m
Shearer		
Manufacturer	Dresser BJD Ace	Anderson Strathclyde
Type	SERDS	AM500 DERDS
Drum diameter	1.6m	1.8m
Cutting height/method	2.1-2.3m, Uni-Di	2.7m, Uni-Di
Kw/voltage	300kw/1 100v	375kw/1 100v
Roof Support		
Manufacturer	Dowty	Dowty
Type	2-Leg Chock Shield	4-Leg Chock Shield
Yield load	400t	600t
Face conveyor (AFC)		
Manufacturer	Halbach & Braun	Dowty
Width/chain size	7322mm/30x108mm	839mm/26mm (twin centre)
Kw	160kw	2 x 225kw
Stage loader	–	Dowty
Coal crusher	Klockner Becorit SB63M	Dowty
Coal clearance (to surface)		
Type	Conveyor	Conveyor
Capacity	800tph	1 850tph
Other face equipment	1 x Joy 12CMI C/Miner 2 x Jeffrey 1036 C/Miners 3 x Joy 12CM3 C/Miners 2 x Joy 10SC S/Cars 8 x Joy 22SC S/Cars	2 x Joy 12CM20 C/Miners 3 x Jeffrey Heliminers 2 x Joy 22SC S/Cars 6 x Joy 15SC S/Cars
Product	Export steaming, soft and semi-soft coking	Domestic coking
Transport	By road (14km) to Newcastle	Rail to Port Kembla steelworks

(a) Plus 1 x 7hr shift, 5 days per week

LIDDELL STATE	NEWSTAN	PELTON/ELLALONG
Elcom Collieries Pty Ltd Hunter/Singleton-NW Liddell (4.0-5.0) 60Mt raw	Elcom Collieries Pty Ltd Newcastle/Newcastle Y. Wallsend(3.3m), Fassifern(4.8m) 60.8Mt raw, 45.4Mt saleable	Newcastle Wallsend Coal Co Pty Ltd Newcastle/Newcastle Greta (3.0-3.6m) 60Mt raw, 45Mt saleable
4 x 7hr shifts, 5 days (a) 391 100t 152 600t 543 700t 520 500t (not operating) 250tph	4 x 7hr shifts, 5 days (a) 1 861 800t 288 500t 2 150 300t 1 646 600t 4 x 7hr shifts, 5 days (a) 700tph	4 x 7hr shifts, Mon-Fri (a) 1 482 000t 268 400t 1 750 400t 1 421 900t 3 x 8hr shifts, Mon-Sat 475tph
125 58 183 – 183 2 517t 2 410t	242 119 361 12 373 5 704t 4 368t	301 69 370 72 442 3 987t 3 239t
November 1986 200m 910m Liddell, 70-100m	August 1984 200m 988m Young Wallsend, 285-310m	June 1983 183m 1 550m Greta, 370-500m
Anderson Strathclyde AM500 DERDS 1.9m 3.3m, Uni-Di 2 x 375kw/3 300v	Anderson Strathclyde AM500 DERDS 1.8m 3.2m, Uni-Di 2 x 375kw/3 300v	Anderson Strathclyde AM500 DERDS 1.8m 3.2-3.6m, Uni-Di 375kw/1 000v
Dowty 4-Leg Chock Shield 650t Dowty 839mm/30mm 2 x 300kw	Dowty 4-Leg Chock Shield 650t Dowty 839mm/30 x 108mm 2 x 300kw	Dowty 4-Leg Chock Shield 600/800t Dowty Meco 839mm/30mm 700kw
Dowty MMD S108 Conveyor 1 400tph	Dowty Dowty 2000 T/11 Conveyor 2 200tph	Dowty Meco Klockner Becorit Conveyor 660tph
1 x Joy 12CM20 C/Miner 1 x Jeffrey 120H2 Heliminer 2 x Joy 12HM7 C/Miners 6 x Joy 15 SC S/Cars 2 x Joy 22SC S/Cars	1 x Joy 12 CM20 C/Miner 1 x Alpine AM50 Miner 2 x Alpine AM75 Miners 5 x Jeffrey 120H2 Heliminers 10 x Joy 22CS S/Cars	1 x Joy 11CM C/Miner 1 x Dosco 3 000 In-Seam Miner 1 x Dosco 2 100 In-Seam Miner 2 x Dosco Dintheaders 4 x Joy 12CM5 C/Miners 9 x Joy 22SC S/Cars
Domestic steaming Conveyor to Liddell power station	Domestic steaming By private road (12km) to Eraring power station	Export steaming and soft coking Rail (66km) to Newcastle
(a) Plus 2 x 7hr shifts, Sat	(a) Plus 2 x 7hr shifts, Sat	(a) Plus1 x 7hr shift Tues-Sat 1 x 7hr shift, Fri-Tues

B. LONGWALL MINES, 1990 SURVEY

	SOUTH BULLI (a)	TAHMOOR
Company	Austen & Butta Ltd	Kembla Coal & Coke P/L
Coalfield/district	South/South	South/South
Seam (thickness)	Bulli (2.3m)	Bulli (2.3m)
Recoverable reserves	61Mt raw, 55Mt saleable	n.a.
Longwall operation (weekly)	4 x 7hr shifts, 5 days	4 x 7hr shifts, 6 days
Raw output, 1989-90		
Longwall face	2 616 400t	1 324 600t
Other	266 200t	422 900t
Total	2 882 700t	1 747 600t
Saleable output, 1989-90	2 055 800t	1 451 000t
Washery		
Operation (weekly)	3 x 8hr shifts, 7days	3 x 7hr shifts, 5 days
Input capacity	650tph	650tph
Employment June 1990		
Below ground	434	371
Surface	137	46
Total mine	571	417
Washery	67	31
Total mine/washery	638	448
Output per employee, 1989-90		
Raw coal	4 547t	3 972t
Saleable coal	3 243t	3 298t
Commenced longwall mining		February 1987
Longwall block dimensions		
Width	183m	220m
Length	1 700m	1 200m
Seam/depth of cover	Bulli, 460m	Bulli, 415m
Shearer		
Manufacturer	2 x Mitsui Miike	Eickhoff
Type	DERDS	DERDS, EDW-230-L
Drum diameter	1.8m	1.6m
Cutting height/method	2.3m, Uni-Di	2.2m, Uni-Di
Kw/voltage	574kw/3 300v	230kw/1 100v
Roof Support		
Manufacturer	2 x Dowty	Dowty
Type	4-Leg Chock Shield	4-Leg Chock Shield
Yield load	800t	780t
Face conveyor (AFC)		
Manufacturer	2 x Dowty Meco	Dowty Meco
Width/chain size	940mm/30mm	940mm/30mm
Kw	750kw	375kw
Stage loader	–	Dowty Meco
Coal crusher	2 x Klockner Becorit SB63MB	MMD S108
Coal clearance (to surface)		
Type	Conveyor	Conveyor
Capacity	850tph	680tph
Other face equipment	1 x Joy 12CM C/Miner 2 x Joy 12CM Widehead 6 x Joy 15SC S/Cars	7 x Joy 12 CM C/Miners 12 x Joy 15SC S/Cars
Product	Export coking and steaming	Export coking and steaming
Transport	Road (14km) to Port Kembla	By rail to Balmain (101km) or Port Kembla (177km)

(a) Two faces with similar equipment

B. LONGWALL MINES, 1990 SURVEY

TERALBA	TOWER	ULAN NO. 2
FAI Mining Ltd	BHP Co Ltd	Ulan Coal Mines Ltd
Newcastle/Newcastle	South/South	West/West
Y. Wallsend (2.8m), Borehole (1.3m)	Bulli (2.1-3.0m)	Ulan (10.0m)
12.0Mt raw, 7.2Mt saleable	n.a.	22Mt raw & saleable
4 x 7hr shifts, 5 days	4 x 7hr shifts, 5 days	3 x 9hr shifts, 5 days
1 006 600t 177 800t 1 184 400t 880 500t	854 800t 200 500t 1 055 300t 1 054 900t	1 457 600t 295 700t 1 753 300t 1 750 800t
4 x 7hr shifts 5 days (a) 900tph	(washed at steelworks) –	– –
255 60 315 74 389	249 54 303 – 303	209 22 231 – 231
3 045t 2 263t	3 742t 3 741t	7 525t 7 514t
July 1984	March 1988	November 1986
200m 1 900m Borehole, 300-340m	100m 1 260m Bulli, 500m	200m 2 000m Ullan, 150-170m
Eickhoff DERDS, EDW-200/230-L 1.45m 1.45m, Bi-Di 230kw/1 000v	Eickhoff DERS, EDW-300L 1.7m 2.1-2.5m, Uni-Di 300kw/1 000v	Eickhoff DERDS, EDW-450/1 000-L 2.2m 3.0m, Bi-Di 1 040kw/3 300v
Dowty 2-Leg Chock Shield 560t Dowty 5400 764mm/26mm (twin centre) 2 x 300kw (MG & TG)	Westfalia 2-Leg Chock Shield 460t Westfalia Panzer MIIVK-600 800mm/26 x 92mm 225kw(MG), 120kw(TG)	Dowty 4-Leg Chock Shield 700t Dowty 1 064mm/34mm 1 050kw
Dowty Klockner Becorit SB62 Conveyor 1 000tph	Westfalia Panzer MIIV-600 Klockner Becorit SB63UN Conveyor/shaft 1 800tph/600tph	Dowty Klockner Becorit Conveyor 3 000tph
2 x Marietta 5012N C/Miners 3 x Jeffrey 120H C/Miners 8 x Joy 22SC S/Cars	5 x Joy 12CM C/Miners 2 x Joy 15SC S/Cars 6 x Joy 22SC S/Cars 1 x Petito Mule	1 x Jeffrey 120H2 C/Miner 2 x Joy 12CM-HM9 C/Miners 8 x Noyes Hydrocars
Export and domestic coking, export steaming By rail (17km) to Newcastle port or Newcastle steelworks	Domestic coking Road to O'Brien's Drift then rail to Port Kembla steelworks	Export & domestic steaming Export coal by rail (279km) to Newcastle; domestic coal by road (various)

(a) Washery also serves West Wallsend mine

B. LONGWALL MINES, 1990 SURVEY

	WEST CLIFF	WEST WALLSEND
Company	Kembla Coal and Coke Pty Ltd	FAI Mining Ltd
Coalfield/district	South/South	Newcastle/Newcastle
Seam (thickness)	Bulli (2.2-2.8m)	Borehole (2.0-2.8m)
Recoverable reserves	43Mt raw, 34.3Mt saleable	20.0Mt raw, 15.3Mt saleable
Longwall operation (weekly)	4 x 7hr shifts, 6 days	4 x 7hr shifts, 5/6 days
Raw output, 1989-90		
Longwall face	893 000t	919 100t
Other	677 000t	492 800t
Total	1 570 000t	1 411 900t
Saleable output, 1989-90	1 332 600t	1 116 900t
Washery		
Operation (weekly)	3 x 7hr shifts, 6 days	(see Teralba)
Input capacity	700tph	(see Teralba)
Employment June 1990		
Below ground	379	232
Surface	66	60
Total mine	445	292
Washery	38	(see Teralba)
Total mine/washery	483	292
Output per employee, 1989-90		
Raw coal	2 957t	4 819t
Saleable coal	2 510t	3 812t
Commenced longwall mining	August 1982	April 1989
Longwall block dimensions		
Width	200m	123m
Length	1 760m	1 950m
Seam/depth of cover	Bulli, 500-520m	Borehole, 180-220m
Shearer		
Manufacturer	Anderson Strathclyde	Mitsui Miike
Type	AM500 DERDS	DERDS
Drum diameter	1.8m	1.8m
Cutting height/method	2.2-2.7m, Uni-Di	2.0-2.8m, Uni-Di
Kw/voltage	375kw/1 000v	350kw/1 100v
Roof Support		
Manufacturer	Gullick Dobson	Mitsui
Type	4-Leg Chock Shield	2-Leg Chock Shield
Yield load	1 000t	640t
Face conveyor (AFC)		
Manufacturer	Halbach & Braun	Mitsui
Width/chain size	1 000mm/32mm (twin centre)	800mm/26mm
Kw	600kw	225kw(MG), 150kw(TG)
Stage loader	Halbach & Braun	Mitsui
Coal crusher	Halbach & Braun SK18/11 1H	Klockner Becorit
Coal clearance (to surface)		
Type	Conveyor/shaft	Conveyor
Capacity	2 000tph/900tph	800tph
Other face equipment	1 x Joy 12CM6 C/Miner 1 x Joy 12CM20 C/Miner 7 x Joy 12CM3 C/Miners 4 x Joy 22SC S/Cars 2 x Noyes HE10 Hydrocars 9 x Joy 15SC S/Cars	3 x Joy 12CM3 C/Miner 1 x Marietta 5012N C/Miner 9 x Joy 22SC S/Cars
Product	Export coking	Export and domestic coking, export steaming
Transport	By road (42km) to Port Kembla coal loader	By road to Macquarie CPP at Teralba for washing then by rail (17km) to Newcastle port or Newcastle steelworks

WYEE STATE		
Elcom Collieries Pty Ltd Newcastle/Newcastle Gt Northern (2.4m), Fassifern (4.0m) 118.6Mt raw & saleable		
4 x 7hr shifts, 5 days 1 144 100t 581 800t 1 725 900t 1 725 900t – –		
293 90 383 – 383 4 506t 4 506t		
November 1986 234m 1 525m Fassifern, 180-215m		
Anderson Strathclyde AM500 DERDS 1.8m 2.8m, Uni-Di 500kw/3 300v		
Dowty 4-Leg Chock Shield 650t Dowty Meco 839mm/30 x 108mm 600kw		
Dowty Meco MMD Conveyor 1 000tph		
1 x Lee Norse 60H C/Miner 2 x Jeffrey 1036 Heliminers 5 x Joy 12HM7 C/Miners 12 x Joy 15SC S/Cars		
Domestic steaming By conveyor to Vales Point power station		

NON-LONGWALL UNDERGROUND MINE SURVEY

Roofbolting, Newvale colliery

C. NON-LONGWALL UNDERGROUND MINES, 1990 SURVEY

	AVON	AWABA STATE
Company	Avon Colliery Pty Ltd	Elcom Collieries Pty Ltd
Coalfield	South	Newcastle
District	South	Newcastle
Seam(s) worked		
Name	Wongawilli	Great Northern
Thickness	10.0m	3.0m
Cutting height	3.2m	3.0m
Depth of cover	180m	30-60m
Recoverable reserves		
Raw coal	3.7Mt	10.0Mt
Saleable coal	3.2Mt	10.0Mt
Production schedule (weekly)	2 x 7hr shifts, 5 days	4 x 7hr shifts, 5 days
Mine output, 1989-90		
Raw coal	270 600t	1 047 700t
Saleable coal	239 900t	1 047 700t
Washery		
Operation (weekly)	2 x 7hr shifts, 3 days	–
Input capacity	200tph	–
Employment, June 1990		
Below ground	27	207
Surface	12	83
Total mine	39	290
Washery	(from mine employees)	–
Total mine/Washery	39	290
Output per employee, 1989-90		
Raw coal	7 121t	3 564t
Saleable coal	6 313t	3 564t
Face equipment	1 x Joy 12CM11 C/Miner 2 x Noyes HE60 Hydrocars	2 x Joy 12CM11 C/Miners 3 x Jeffrey 120H2 C/Miners 11 x Joy 15SC S/Cars
Coal clearance (to surface)		
Type	Conveyor	Conveyor
Capacity	900tph	1 000tph
Products	Export, domestic coking and steaming	Domestic steaming
Transport	By road to Port Kembla coal loader and domestic consumers	By private road to Eraring power station

C. NON-LONGWALL UNDERGROUND MINES, 1990 SURVEY

BERRIMA	BLOOMFIELD	BLUE MOUNTAINS
BCSC Collieries Pty Ltd	Bloomfield Collieries Pty Ltd	Hartley Valley Coal Co Pty Ltd
South	Newcastle	West
South	Newcastle	West
Wongawilli	Rathluba	Lithgow
8.0m	2.0-2.8m	1.8m
2.2m	2.4m	1.8m
120m	152m	270m
63.7Mt	14.2Mt	n.a.
52.9Mt	7.9Mt	n.a.
2 x 8hr shifts, 9 day f/night	3 x 7hr shifts, 5 days	2 x 8hr shifts, 9 day f/night
245 700t	213 500t	194 200t
245 700t	123 100t	164 700t
–	4 x 7hr shifts, 5 days(a)	2 x 8hr shifts, 9 day f/night
–	500tph	105tph
36	44	32
14	25	10
50	69	42
–	29	6
50	98	48
4 914t	2 179t	4 316t
4 914t	1 256t	3 660t
1 x Lee Norse 60H C/Miner 2 x Joy 15SC S/Cars	2 x Joy 12CM C/Miners 1 x Joy 22SC S/Car 4 x Joy 10SC S/Cars	1 x Joy 12CM C/Miner 1 x Jeffrey 122M C/Miner 4 x Joy 22SC S/Cars 1 x Noyes Hydrocar
Conveyor 400tph	Conveyor 400tph	Conveyor 450tph
Domestic steaming	Export soft/semi-soft coking and steaming coals	Domestic steaming
Road to local cement works	By road to Thorton Siding then rail (30km) to Newcastle	By road to Wallerawang power station & other local consumers

(a) Washery also serves Bloomfield open cut

C. NON-LONGWALL UNDERGROUND MINES, 1990 SURVEY

	CHAIN VALLEY	CHARBON
Company	Coal & Allied Industries Ltd	BCSC Collieries Pty Ltd
Coalfield	Newcastle	West
District	Newcastle	West
Seam(s) worked		
Name	Wallarah, Great Northern	Lithgow
Thickness	1.8-3.0m	2.7m
Cutting height	1.8-3.0m	2.7m
Depth of cover	130-190m	15-120m
Recoverable reserves		
Raw coal	100.1Mt	12.0Mt
Saleable coal	88.4Mt	9.6Mt
Production schedule (weekly)	3 x 8hr shifts, 6 days	3 x 8hr shifts, 9 day f/night
Mine output, 1989-90		
Raw coal	849 400t	606 200t
Saleable coal	824 900t	470 800t
Washery		
Operation (weekly)	–	3 x 8hr shifts, 9 day f/night
Input capacity	–	160tph
Employment, June 1990		
Below ground	193	76
Surface	57	19
Total mine	250	95
Washery	–	13
Total mine/Washery	250	108
Output per employee, 1989-90		
Raw coal	3 331t	5 511t
Saleable coal	3 235t	4 280t
Face equipment	2 x Joy 12CM11 C/Miners 2 x Joy 10CM2 C/Miners 2 x Jeffrey 120H2 Heliminers 10 x Joy 15SC S/Cars	1 x Lee Norse 546HH C/Miner 2 x Joy 12CM11 C/Miners 6 x Joy 15SC S/Cars 2 x Voest Alpine BL Supports
Coal clearance (to surface)		
Type	Conveyor	Conveyor
Capacity	700tph	600tph
Products	Domestic steaming	Export steaming & semi-soft coking domestic steaming
Transport	Conveyor to Vales Point power station	Export coal by rail to Port Kembla (336km) or Balmain (247km); domestic coal by road to Wallerawang power station

C. NON-LONGWALL UNDERGROUND MINES, 1990 SURVEY

CLARENCE	COAL CLIFF	COORANBONG
Coalex Pty Ltd West West	Kembla Coal & Coke Pty Ltd South South	Newcom Collieries Pty Ltd Newcastle Newcastle
Katoomba 3.8m 3.5m 120-170m	Bulli 1.8-3.0m 2.0-2.8m 430-500m	Great Northern 3.0m 2.5m 65-125m
67.0Mt 60.0Mt	11.6Mt 10.1Mt	25.0Mt 25.0Mt
3 x 7hr shifts, 6 days 1 705 400t 1 602 500t	4 x 7hr shifts, 5 days 1 340 100t 1 138 900t	4 x 7hr shifts, 5 days 1 213 200t 1 213 200t
2 x 7hr shifts, 5 days 675tph	3 x 8hr shifts, 5 days 600tph	– –
302 38 340 28 368 4 737t 4 451t	291 42 333 61 394 3 161t 2 686t	265 66 331 – 331 3 665t 3 665t
1 x Joy HM9-CH C/Miner 2 x Joy 12 HM9 C/Miners 3 x Joy 12CM11 C/Miners 10 x Joy 15SC S/Cars 4 x Voest Alpine BL Supports	1 x Lee Norse 106 C/Miner 4 x Joy 12CM C/Miners 3 x Joy 10CM C/Miners 10 x Joy 15SC S/Cars 9 x Joy 22SC S/Cars 11 x Voest Alpine BL Supports	1 x Voest Alpine AM75 10 x Jeffrey 120H2 Heliminers 18 x Joy 15SC S/Cars 2 x Voest Alpine BL Supports
Conveyor 2200tph	Conveyor 600tph	Conveyor 1 500tph
Export steaming	Export & domestic coking & steaming	Domestic steaming
Rail to Port Kembla (223km) or Balmain (144km)	Export coal by road or rail to Port Kembla; domestic coal by conveyor to coke works and by road or rail to others	Conveyor to Eraring power station

C. NON-LONGWALL UNDERGROUND MINES, 1990 SURVEY

	GREAT GRETA	GUNNEDAH NO. 2
Company	Barix Pty Ltd	Gunnedah Coal Co Ltd
Coalfield	Newcastle	Gunnedah
District	Singleton-North West	Singelton-North West
Seam(s) worked		
Name	Tangorin	Hoskisson
Thickness	2.6-4.0m	8.0m
Cutting height	2.6-4.0m	2.5-2.8m
Depth of cover	110-130m	160-190m
Recoverable reserves		
Raw coal	13.0Mt	24.0Mt
Saleable coal	13.0Mt	19.0Mt
Production schedule (weekly)	4 x 7hr shifts, 5 days	3 x 8hr shifts 9 day f/night
Mine output, 1989-90		
Raw coal	402 000t	644 700t
Saleable coal	402 000t	537 000t
Washery		
Operation (weekly)	–	3 x 8hr shifts, 9 day f/night (a)
Input capacity	–	450tph
Employment, June 1990		
Below ground	54	159
Surface	16	26
Total mine	70	185
Washery	–	37
Total mine/Washery	70	222
Output per employee, 1989-90		
Raw coal	5 912t	2 971t
Saleable coal	5 912t	2 475t
Face equipment	2 x Joy 12CM11 C/Miners 5 x Joy 15SC S/Cars	1 x Jeffrey 1036 C/Miner 2 x Lee Norse 546HH C/Miners 2 x Joy 12CM C/Miners 2 x Lee Norse 60H C/Miners 3 x Joy 22SC S/Cars 8 x Joy 15SC S/Cars
Coal clearance (to surface)		
Type	Conveyor	Conveyor
Capacity	300tph	1 200tph
Products	Export steaming	Export steaming & semi-soft coking
Transport	Road to Branxton Siding then rail (50km) to Newcastle	Rail (320km) to Newcastle

(a) Washery also serves Gunnedah open cut

INVINCIBLE	IVANHOE NO. 2	KANDOS
Coalpac Pty Ltd	BCSC Collieries Pty Ltd	Kandos Collieries Pty Ltd
West	West	West
West	West	West
Lithgow	Lithgow	Lithgow
3.8m	5.2m	3.0m
2.4m	2.8m	2.4-3.0m
100m	30-80m	200-220m
3.4Mt	3.7Mt	8.0Mt
2.9Mt	3.3Mt	8.0Mt
1 x 8hr shift, 9 day f/night	3 x 8hr shifts, 4 days	2 x 7hr shifts, 5 days
194 300t	348 600t	133 400t
180 200t	333 500t	133 400t
2 x 12hr shifts per week	3 x 8hr shifts, 4 days	–
350tph	120tph	–
32	44	20
4	17	13
36	61	33
3	3	–
39	64	33
6 072t	5 447t	4 042t
5 631t	5 211t	4 042t
1 x Joy 12CM6 C/Miner 1 x Joy 12CM11 C/Miner 4 x Noyes Hydrocars	2 x Lee Norse 546HH C/Miners 4 x Noyes HE1560 Hydrocars	1 x Joy 12CM11 C/Miner 1 x Marietta 5012 C/Miner 2 x Fox 60/60 Torcars 4 x Noyes Hydrocars MKV
Conveyor	Conveyor	Conveyor
1 200tph	250tph	500tph
Export steaming	Export & domestic steaming	Domestic steaming (cement)
By rail (220km) to Port Kembla	Export coal by rail to Port Kembla (270km) or Balmain (180km). Domestic coal by road to Wallerawang power station and other local consumers	By road (2.5km) to cement works

C. NON-LONGWALL UNDERGROUND MINES, 1990 SURVEY

	LAMBTON	LEMINGTON NO. 1
Company	Pacific Copper Ltd	Lemington Coal Mines Ltd
Coalfield	Newcastle	Hunter
District	Newcastle	Singleton-North West
Seam(s) worked		
Name	Dudley, Borehole	Mount Arthur
Thickness	2.0m, 2.0m	5.0m
Cutting height	1.8m, 1.4m	2.8-3.0m
Depth of cover	70m, 60-80m	175-240m
Recoverable reserves		
Raw coal	6.0Mt	8.2Mt
Saleable coal	6.0Mt	5.4Mt
Production schedule (weekly)	4 x 7hr shifts, 5 days	3 x 8hr shifts, 9 day f/night
Mine output, 1989-90		
Raw coal	623 500t	851 700t
Saleable coal	623 500t	603 400t
Washery		
Operation (weekly)	(washed at steelworks)	(see O/C mine)
Input capacity	–	(see O/C mine)
Employment, June 1990		
Below ground	181	163
Surface	46	85
Total mine	227	248
Washery	–	(see O/C mine)
Total mine/Washery	227	248
Output per employee, 1989-90		
Raw coal	2 747t	3 579t
Saleable coal	2 747t	2 535t
Face equipment	1 x Joy 12CM1 C/Miner 2 x Joy 12CM3 C/Miners 1 x Jeffrey 120H Heliminer 2 x Jeffrey 122M Heliminers 12 x Joy 22SC S/Cars	2 x Lee Norse C/Miners 4 x Joy 12CM11 C/Miners 12 x Noyes Hydrocars
Coal clearance (to surface)		
Type	Conveyor	Conveyor
Capacity	550tph	1 200tph
Products	Domestic coking	Export soft coking & steaming
Transport	By rail to Newcastle steelworks	Road to Mt Thorley Coal Loader then rail (85km) to Newcastle

LIDDELL	METROPOLITAN	MOONEE
Liddell Joint Venture	Metropolitan Collieries Ltd	Coal & Allied Industries Ltd
Hunter	South	Newcastle
Singleton-North West	South	Newcastle
Liddell 2.5-7.0m 2.5m 50-150m	Bulli 3.0m 3.0m 350-460m	Wallarah 5.0m 3.9m 130m
80.0Mt 75.0Mt	80.0Mt 70.0Mt	2.2Mt n.a.
3 x 8hr shifts, 5 days 574 300t 426 200t	4 x 7hr shifts, 5 days 662 100t 566 100t	3 x 8hr shifts, Mon-Sat 637 900t 594 000t
2 x 8hr shifts, 5 days (a) 600tph	2 x 7hr shifts, 5 days 300tph	3 x 8hr shifts, 6 days (a) 450tph
119 42 161 47 208 2 829t 2 100t	179 43 222 8 230 3 037t 2 597t	100 34 134 69 203 3 322t 2 034t
2 x Joy 10CM C/Miners 2 x Joy 12CM C/Miners 1 x Joy HM7 C/Miner 7 x Joy 15SC S/Cars	1 x Joy 12CM11 C/Miner 2 x Joy 12CM4 C/Miners 1 x Joy 12CM20 C/Miner 4 x Joy 22SC S/Cars 7 x Joy 15SC S/Cars 2 x Voest Alpine BL supports	1 x Joy 12HM9 C/Miner 1 x Marietta 5012 C/Miner 1 x Jeffrey 122M Heliminer 1 x Joy 10SC Breaker Car 5 x Joy 15SC S/Cars 1 x Joy FCT Model 2
Conveyor 1 000tph	Conveyor 300tph	Conveyor 800tph
Export soft coking	Export coking and steaming, domestic coking	Export and domestic steaming
By rail (107km) to Newcastle	Export coal by rail/road (40km) to Port Kembla; domestic coal by rail to Newcastle steelworks	By ship to Newcastle or Balls Head coal loaders

(a) Washery also serves Liddell open cut

(a) Washery also serves Wallarah mine

C. NON-LONGWALL UNDERGROUND MINES, 1990 SURVEY

	MUNMORAH STATE	MUSWELLBROOK NO. 2
Company	Elcom Collieries Pty Ltd	Muswellbrook Coal Co. Ltd
Coalfield	Newcastle	Hunter
District	Newcastle	Singleton-North West
Seam(s) worked		
Name	Great Northern	Fleming, Muswellbrook, Lewis
Thickness	2.4-3.0m	2.0-6.0m
Cutting height	2.4-3.0m	2.0-6.0m
Depth of cover	180-210m	30-100m
Recoverable reserves		
Raw coal	62.4Mt	0.8Mt
Saleable coal	62.4Mt	0.8Mt
Production schedule (weekly)	4 x 7hr shifts, 5 days	3 x 8hr shifts, 5 days
Mine output, 1989-90		
Raw coal	1 222 300t	305 800t
Saleable coal	1 222 300t	305 800t
Washery		
Operation (weekly)	–	–
Input capacity	–	–
Employment, June 1990		
Below ground	219	47
Surface	75	11
Total mine	294	58
Washery	–	–
Total mine/Washery	294	58
Output per employee, 1989-90		
Raw coal	4 074t	5 365t
Saleable coal	4 074t	5 365t
Face equipment	7 x Jeffrey 120H Heliminers 5 x Noyes Torcars 12 x Joy 15SC S/Cars	1 x Joy 12HM9 C/Miner 1 x Joy CM11 C/Miner 1 x Lee Norse 60H C/Miner 2 x Joy 10SC S/Cars 2 x Joy 15SC S/Cars 3 x Lee Norse 15HE Hydrocars
Coal clearance (to surface)		
Type	Conveyor	Conveyor
Capacity	950tph	600tph
Products	Domestic steaming	Export steaming & semi-soft coking, domestic steaming
Transport	Conveyor to Munmorah power station	Export coal by road (125km) to Newcastle; domestic coal by road to Liddell & Bayswater power stations

C. NON-LONGWALL UNDERGROUND MINES, 1990 SURVEY

MYUNA	NATTAI	NEBO
Newcom Collieries Pty Ltd	Clutha Ltd	BHP Co Ltd
Newcastle	South	South
Newcastle	South	South
Wallarah, Gt Northern, Fassifern	Bulli	Wongawilli
3.0m, 2.5m, 5.0m	1.2-2.2m	9.3m
2.2m, 2.5m, 3.0m	1.4-2.2m	3.0m
70-520m	300m	110-300m
99.0Mt	0.8Mt	62.5Mt
99.0Mt	0.6Mt	47.0Mt
4 x 7hr shifts 5 days	3 x 7hr shifts, 5 days	3 x 7hr shifts, 5 days
1 450 300t	471 000t	477 700t
1 450 300t	379 600t	477 700t
–	3 x 8hr shifts, 6 days (a)	(washed at steelworks)
–	600tph	–
272	72	120
53	4	46
325	76	166
–	47	–
325	123	166
4 490t	3 861t	2 895t
4 490t	3 111t	2 895t
1 x Jeffrey 1036 Heliminer 8 x Jeffrey 120H2 Heliminers 18 x Joy 15SC S/Cars	3 x Joy 12CM3 C/Miners 2 x Joy 15SC S/Cars 2 x Joy 10SC S/Cars 2 x Joy 22SC S/Cars	2 x Joy 12CM C/Miners 4 x Joy 10CM C/Miners 12 x Joy 15SC S/Cars 3 x Voest Alpine BL Supports
Conveyor 1 250tph	Conveyor 450tph	Conveyor/locomotive 600tph
Domestic steaming	Export coking and steaming	Domestic coking
Conveyor to Eraring power station	Rail (165km) or road (70km) to Port Kembla; rail (85km) to Balmain	Rail to Port Kembla steelworks

(a) Washery also serves Brimstone and Oakdale mines

C. NON-LONGWALL UNDERGROUND MINES, 1990 SURVEY

	NEWVALE NO. 1	NEWVALE NO.2
Company	Elcom Collieries Pty Ltd	Elcom Collieries Pty Ltd
Coalfield	Newcastle	Newcastle
District	Newcastle	Newcastle
Seam(s) worked		
Name	Great Northern, Fassifern	Great Northern
Thickness	2.4-3.5m, 2.4-4.9m	2.0-3.0m
Cutting height	2.4m, 2.7m	2.0-3.0m
Depth of cover	175m, 225m	140-180m
Recoverable reserves		
Raw coal	100.0Mt	120.0Mt
Saleable coal	100.0Mt	120.0Mt
Production schedule (weekly)	3 x 7hr shifts, 5 days	2 x 8hr shifts, 9 day f/night
Mine output, 1989-90		
Raw coal	909 800t	306 300t
Saleable coal	909 800t	306 300t
Washery		
Operation (weekly)	–	–
Input capacity	–	–
Employment, June 1990		
Below ground	211	62
Surface	63	29
Total mine	274	91
Washery	–	–
Total mine/Washery	274	91
Output per employee, 1989-90		
Raw coal	3 181t	3 294t
Saleable coal	3 181t	3 294t
Face equipment	2 x Joy 12CM20 C/Miners 2 x Jeffrey 120H2 Heliminers 3 x Joy 12HM7 C/Miners 3 x Lee Norse 60H C/Miners 17 x Joy 15SC S/Cars 4 x Voest Alpine BL Supports 1 x Joy Flexible Conveyor Train (floor mounted)	4 x Jeffrey 120H2 Heliminers 8 x Joy 15SC S/Cars
Coal clearance (to surface)		
Type	Conveyor	Conveyor/shaft
Capacity	1 200tph	750tph/600tph
Products	Domestic steaming	Domestic steaming
Transport	Conveyor to Vales Point power station	Conveyor to Munmorah power station

C. NON-LONGWALL UNDERGROUND MINES, 1990 SURVEY

NORTH CLIFF	OAKDALE	PRESTON EXTENDED
Kembla Coal & Coke Pty Ltd	Clutha Ltd	Preston Coal Holdings Pty Ltd
South	South	Gunnedah
South	South	Singleton-North West
Bulli	Bulli	Hoskisson
2.1m	1.9-2.1m	8.0m
2.1m	1.9-2.1m	2.5-3.6m
460m	400m	70-200m
n.a.	50.0Mt	2.0Mt
n.a.	40.0Mt	2.0Mt
3 x 8hr shifts, 5 days	4 x 7hr shifts, 5 days	3 x 8hr shifts, 9day f/night
38 000t (a)	705 700t	343 300t
32 800t (a)	552 700t	343 300t
(see West Cliff)	(see Nattai)	–
(see West Cliff)	(see Nattai)	–
32	153	67
13	20	12
45	173	79
(see West Cliff)	(see Nattai)	–
45	173	79
– (a)	4 226t	4 346t
– (a)	3 310t	4 346t
2 x Joy 12CM3 C/Miners 2 x Joy 22SC S/Cars 2 x Noyes Hydrocars	2 x Joy 12CM C/Miners 3 x Joy 12CM3 C/Miners 6 x Joy 15SC S/Cars 3 x Voest Alpine BL Supports	1 x Lee Norse 60H C/Miner 2 x Jeffrey 120H Heliminers 2 x Joy 15SC S/Cars 2 x Noyes Hydrocars 4 x Joy 10SC6 S/Cars 3 x Voest Alpine BL Supports
Conveyor/shaft 1 000tph/60tph	Conveyor/shaft 700tph/315tph	Conveyor 700tph
Export coking	Export coking & steaming	Export & domestic steaming
By road (42km) to Port Kembla coal loader	Rail (165km) or road (70km) to Port Kembla; rail (85km) to Balmain	Export coal by road (8km) to Curlewis Siding then rail (305km) to Newcastle; domestic coal by road (various)

(a) Operation separated from Westcliff in January 1990

C. NON-LONGWALL UNDERGROUND MINES, 1990 SURVEY

	VICKERY	WALLARAH
Company	Novacoal Australia Pty Ltd	Coal & Allied Industries Ltd
Coalfield	Gunnedah	Newcastle
District	Singleton-North West	Newcastle
Seam(s) worked		
Name	Gundawarra	Wallarah, Great Northern
Thickness	3.0m	5.0m, 3.0m
Cutting height	3.0m	3.5m, 2.8m
Depth of cover	25-30m	90-120m
Recoverable reserves		
Raw coal	0.13Mt	111.5Mt
Saleable coal	0.12Mt	68.1Mt
Production schedule (weekly)	1 x 8hr shift, 9 day f/night	3 x 8hr shifts, 6 days
Mine output, 1989-90		
Raw coal	101 400t	832 600t
Saleable coal	97 200t	775 900t
Washery		
Operation (weekly)	1 x 8hr shift, 9 day f/night	(see Moonee)
Input capacity	30tph	(see Moonee)
Employment, June 1990		
Below ground	14	173
Surface	8	38
Total mine	22	211
Washery	(from mine employees)	(see Moonee)
Total mine/Washery	22	211
Output per employee, 1989-90		
Raw coal	4 609t	3 965t
Saleable coal	4 418t	3 695t
Face equipment	1 x Joy 10CM C/Miner 2 x Joy 15SC S/Cars	5 x Marietta 5012N C/Miners 8 x Joy 15SC S/Cars 2 x Joy Flexible Conveyor Trains (122m)
Coal clearance (to surface)		
Type	Conveyor	Conveyor
Capacity	400tph	400tph
Products	Export steaming	Export and domestic steaming
Transport	By road to Gunnedah Siding then rail (320km) to Newcastle	By road to Catherine Hill Bay washery (Moonee) then by ship to Newcastle or Balls Head coal loaders

C. NON-LONGWALL UNDERGROUND MINES, 1990 SURVEY

WAMBO	WESTERN MAIN	WONGAWILLI
Wambo Mining Corp Pty Ltd	Novacoal Australia Pty Ltd	BHP Co Ltd
Hunter	West	South
Singleton-North West	West	South
Whybrow 2.7-4.0m 2.7-4.0m 80-150m	Lithgow 2.3m 2.3m 20-30m	Wongawilli 10.0m 3.0m 300-340m
n.a. n.a.	3.0Mt 2.6Mt	n.a. n.a.
4 x 7hr shifts, Mon-Fri 1 081 300t 744 100t	2 x 7hr shifts, 5 days 571 100t 494 600t	3 x 8hr shifts, 9 day f/night 658 100t 658 100t
3 x 8hr shifts, Mon-Sat (a) 450tph	2 x 7hr shifts, 5 days 150tph	(washed at steelworks) –
190 66 256 57 313 3 444t 2 370t	32 13 45 7 52 10 576t 9 159t	123 41 164 – 164 4 088t 4 088t
2 x Joy 12HM9 C/Miners 4 x Joy 12CM11 C/Miners 10 x Joy 15SC S/Cars	2 x Joy 12CM C/Miners 2 x Jeffrey Heliminers 8 x Joy 15SC S/Cars	1 x Jeffrey 120H2 Heliminer 4 x Jeffrey 120H Heliminers 8 x Joy 15 S/Cars 3 x Voest Alpine BL Supports
Conveyor 1 800tph	Conveyor 800tph	Conveyor 450tph
Export steaming & semi-soft coking	Export & domestic steaming	Domestic coking
Road to Mt Thorley Coal Loader then rail (85km) to Newcastle	Export coal by rail to Port Kembla (257km) or Balmain (176km); domestic coal by road to Wallerawang power station and other local consumers	Rail to Port Kembla steelworks

(a) Also serves Wambo open cut

EXPORTS

Shiploading berths, PWCS coal loader

EXPORT TONNAGE

Australia is the world's leading coal exporter with annual exports of around 100 Mt in recent years. NSW currently contributes about 40% of the total, shipping 42.75 Mt in 1989-90. Exports from NSW in 1989-90 consisted of 18.03 Mt of metallurgical coal and 24.72 Mt of steaming coal.

In the Board's statistics, NSW coal exports are classified as metallurgical or steaming according to end use criteria. Metallurgical coal exports are recorded in three categories: hard (low/medium volatile) coking, soft (high volatile) coking and 'other' covering the so-called semi-soft coking and non-coking metallurgical (PCI) coals. The recording basis for exports is on vessel sailing date.

In some of the tables in this section, destinations of exports are shown by the regions Asia, Europe and Other Countries. Asia is divided into Japan, Other North-South East (SE) Asia and Other Asia. Other North-SE Asia includes the following countries to which NSW has exported coal: China, Korea (North and South), ASEAN countries, Hong Kong, Taiwan and Vietnam. Other Asia includes India, Pakistan, Bangladesh, Sri Lanka, Israel, Turkey and Iran. The 'Other Countries' to which NSW has exported coal over the period shown in the tables includes Morocco, Egypt, Ethiopia, Mexico, United States, Argentina, Brazil, Fiji and New Caledonia.

Increasing export demand has been the major factor in the growth of the NSW coal industry over the past three decades. Exports grew from less than 2 Mt in 1960 to 20 Mt per annum by the late 1970's and to over 40 Mt per annum in the late 1980's. Over this period the industry has changed from being primarily domestic orientated to a position where about 60% of output is now sold on the export market. In 1989-90, NSW coal was shipped to twenty five countries in Europe, Asia and the Pacific region. Export earnings from coal for the year amounted to $2.3 billion.

The overall level of NSW coal exports in 1989-90 was 2.47 Mt (6.1%) more than in the previous year with increases recorded for both metallurgical coal (up 1.59 Mt or 9.7%) and steaming coal (up 0.88 Mt or 3.7%). Despite this improvement total exports for the year were still about 1.0 Mt below the peak of 43.78 Mt recorded in 1987-88. While supply problems affecting export performance throughout 1988-89 were largely overcome by mid 1989, the rate of export shipments remained flat through to the end of September. The shipping rate increased significantly in the December quarter and by the June 1990 quarter had reached an annualised rate of 44.7 Mt.

Metallurgical Coal Exports

The development of the NSW coal export trade was a direct result of the rapid post-war growth of the Japanese steel industry and its increasing requirements for imported coking coal. From an initial shipment of 10 000 tonnes in August 1955, NSW Metallurgical coal sales to Japan had increased to nearly 11 Mt by 1972-73. This represented 95% of the State's total coal exports for that year. From the mid 1970's, NSW metallurgical coal exports were boosted by further strong demand from Japan and by the commencement of coal imports by newly-developed steel industries in South Korea and Taiwan.

NSW COAL EXPORTS

	1988-89 (Mt)	1989-90 (Mt)
Japan	23.34	25.19
Korea, Rep of	4.95	5.43
Taiwan	3.65	2.83
Europe	4.18	5.81
Other	4.15	3.49
Total	**40.27**	**42.75**
Metallurgical	16.43	18.03
Steaming	23.84	24.72

NSW MET COAL EXPORTS

	1988-89 (Mt)	1989-90 (Mt)
Japan	11.40	11.73
Korea, Rep of	1.63	2.46
Taiwan	1.23	1.07
Pakistan	0.58	0.31
India	0.33	0.52
United Kingdom	0.50	1.26
Other	0.76	0.68
Total	**16.43**	**18.03**

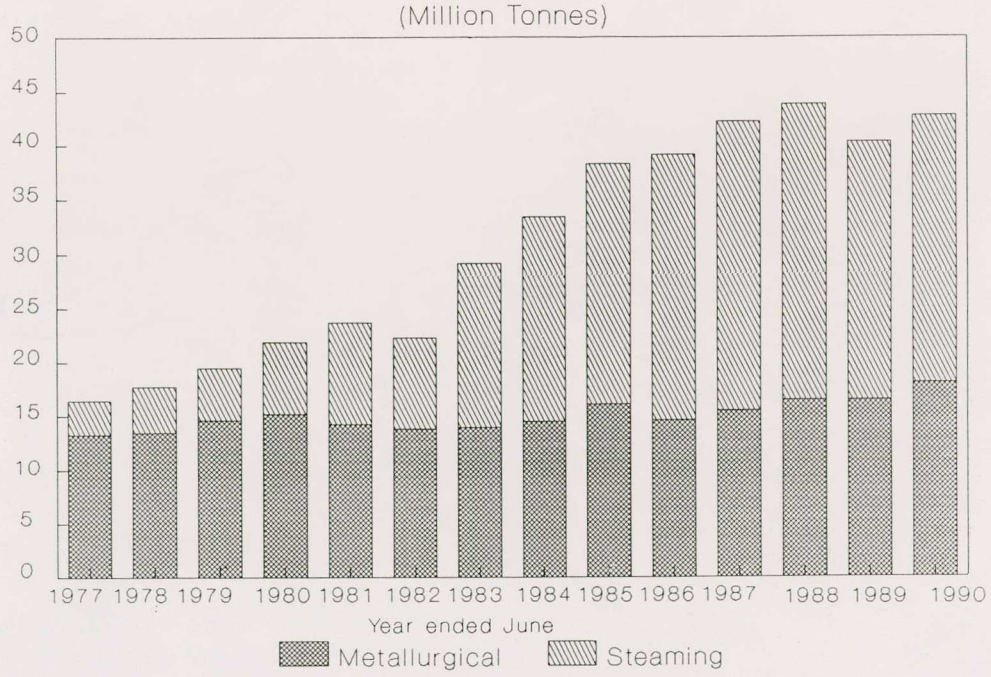
NSW STEAMING COAL EXPORTS

	1988-89 (Mt)	1989-90 (Mt)
Japan	11.93	13.46
Korea, Rep of	3.33	2.97
Taiwan	2.42	1.76
Hong Kong	1.03	0.85
Europe	3.18	4.34
Other	1.95	1.34
Total	**23.84**	**24.72**

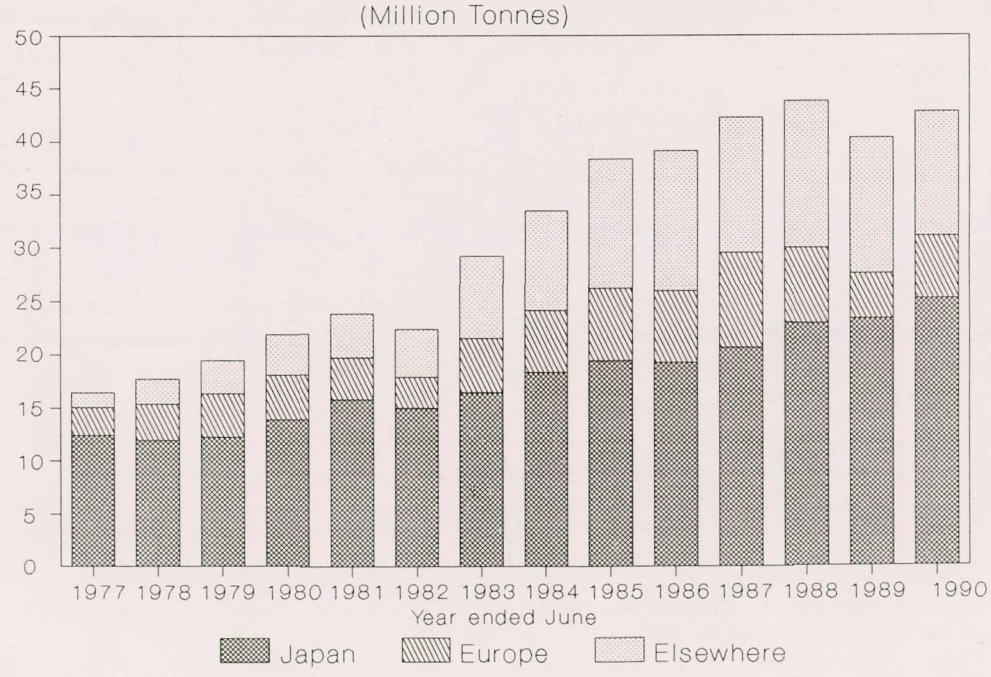
By 1979-80, NSW metallurgical coal exports had increased to just over 15 Mt. In the early 1980's, however, the level of shipments declined to around 14 Mt per annum as a result of a downturn in Japanese steel production and general oversupply of metallurgical coal in world trade. From the mid-1980's NSW metallurgical coal exports showed a sustained recovery with a return to growth in steel production and coal requirements by the Japanese steel industry and the establishment of market outlets in India, Pakistan, Turkey and Europe. Shipments increased by 9.7% in 1989-90 to 18.03 Mt with strong growth in sales to Japan, South Korea and the United Kingdom.

While some success has been achieved over the last decade in diversifying markets, NSW is still dependent on Japan for 65-70% of its metallurgical coal exports. A feature of the trade with the Japanese steel mills in the 1980's has been the shift in demand to the lower-priced semi-soft coking and PCI coals. This has resulted from technological developments by the Japanese steel mills to allow the use of lower grade coal in coke oven blends and for injection, in pulverised form, directly into the blast furnace in place of oil.

NSW Coal Exports By Type

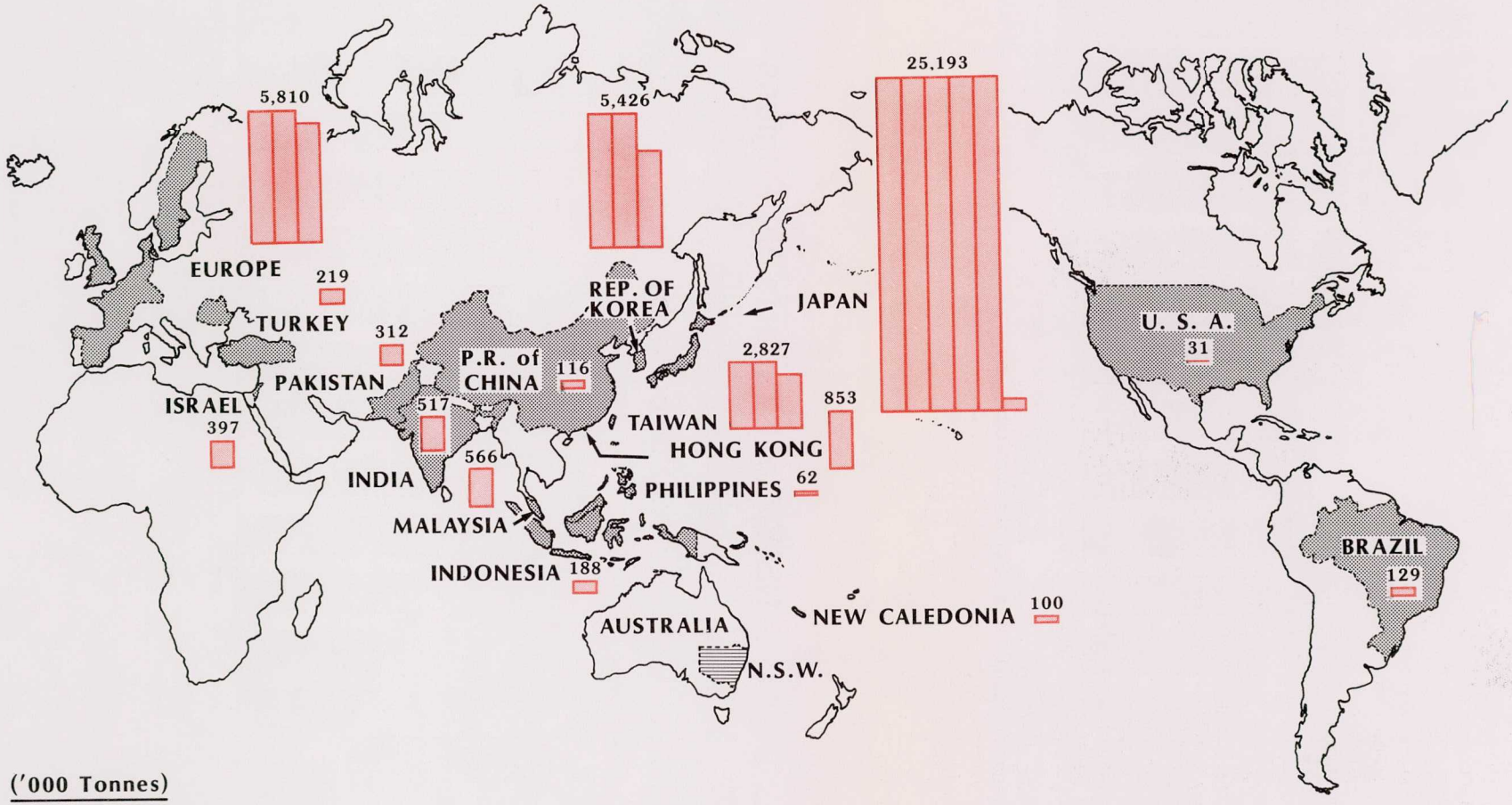


NSW Coal Exports By Regions



NEW SOUTH WALES COAL EXPORTS

1989 - 90



('000 Tonnes)

Steaming Coal Exports

Whilst metallurgical coal exports have increased, the main feature of NSW coal export trade over the past decade has been the very significant expansion of steaming coal exports. Shipments of NSW steaming coal increased from 2.1 Mt in 1970-71 to 6.68 Mt in 1979-80 and to 27.35 Mt in 1987-88. Shipments fell back to 23.84 Mt in 1988-89 with some recovery to 24.72 Mt in 1989-90.

The growth of NSW steaming coal exports has taken place within the general growth of world trade in steaming coal from 50 Mt per annum in the early 1970's to 180 Mt in 1988. This growth has been the outcome of the sharp increases in oil prices in 1973 and again in 1979, which resulted in coal becoming a low cost fuel, and general concern about the future stability of oil supplies.

Many countries in Europe and Asia took policy decisions to reduce their dependence on imported oil in favour of other energy forms including coal. This led to conversion of oil-firing plants and power stations to coal, the construction of new coal-fired power stations and widespread conversions to coal in cement making. In SE Asia, particularly, the demand for imported steaming coal flowing from these developments has been reinforced by high growth rates in GDP and energy consumption.

NSW steaming coal trade with Japan and other SE Asian countries began in the mid 1970's and has since grown to around 20 Mt per annum. Japan is the major customer, taking 13.46 Mt in 1989-90, followed by South Korea (2.97 Mt), Taiwan (1.76 Mt) and Hong Kong (0.85 Mt). In 1989-90, Japan accounted for 54.5% of total NSW steaming coal exports and the SE Asia region as a whole 80.3%.

NSW has had a long steaming coal trade history with Europe which was the major market up to the late 1970's. Shipments increased during the 1980's to a peak of 7.77 Mt in 1986-87. They fell to 3.18 Mt in 1988-89 before showing some recovery to 4.34 Mt in 1989-90. Because of the longer freight distance from Australia, NSW steaming coal faces strong competition in Europe from United States, South African and, more recently, Colombian coal. In recent years China has also entered the market at very competitive prices.

Coke Exports

Exports of coke from NSW have increased very significantly in recent years with shipments rising from 0.15 Mt in 1986-87 to 0.88 Mt in 1988-89 before falling back to 0.59 Mt in 1989-90 as a result of a decline in shipments to the United States. The fob value of coke shipments was $A82.3 million in 1988-89 and $A73.5 million in 1989-90. The major exporter is BHP, from its Port Kembla steelworks. The other supplier is Kembla Coal & Coke Pty Ltd from the Illawarra and Corrimal cokeworks. The increase in coke exports resulted from a rise in demand for imported coke in the United States. In 1988-89 , NSW shipments to the US amounted to 0.61 Mt or 69% of total exports. Shipments fell to 0.24 Mt in 1989-90 representing about 40% of total sales.

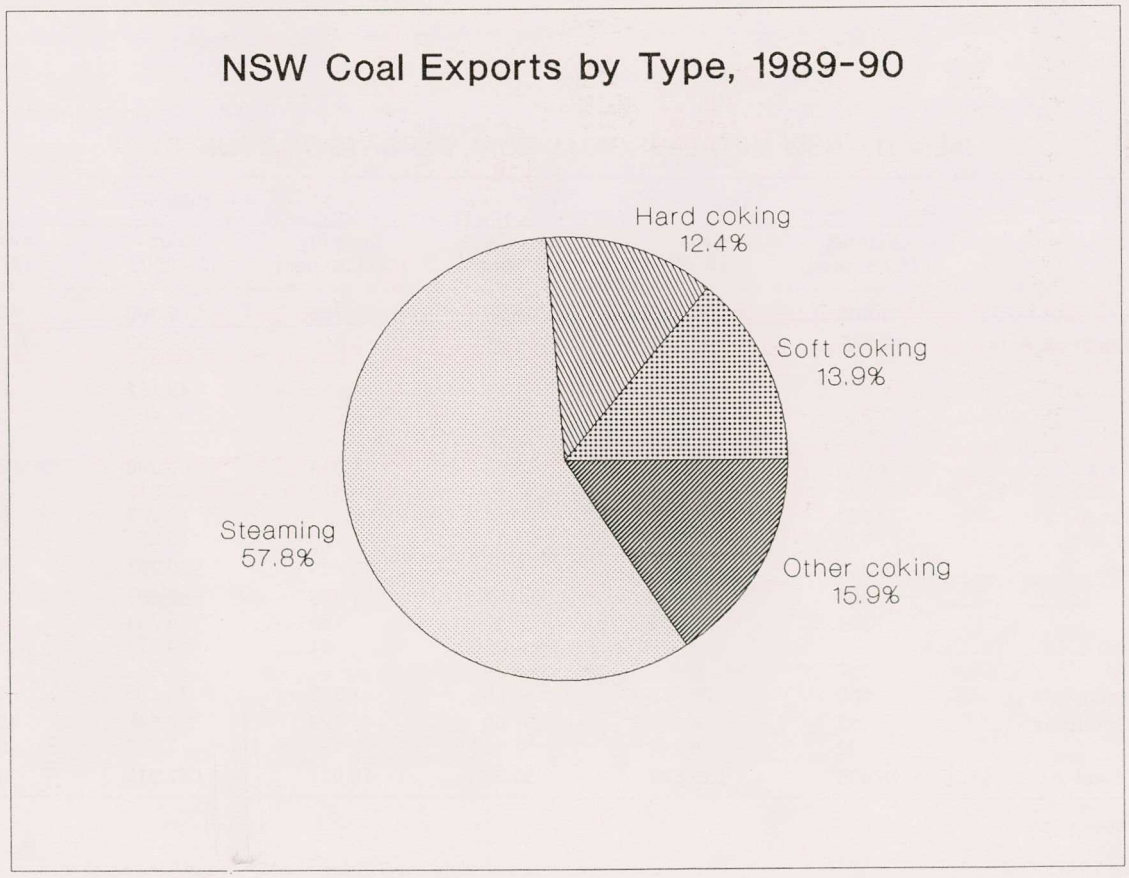


Table 30 – NSW COAL EXPORTS BY COUNTRY

Country	1988-89 (a) Quantity ('000 tonnes)	1988-89 (a) Value ($A'000)	1988-89 (a) Ave Value ($A/ tonne)	1989-90 Quantity ('000 tonnes)	1989-90 Value ($A'000)	1989-90 Ave Value ($A/ tonne)
Japan	**23 335**	**1 086 580**	**46.56**	**25 193**	**1 377 470**	**54.68**
Other North-SE Asia	**10 910**	**480 627**	**44.05**	**10 038**	**526 640**	**52.46**
China (PR)	–	–	–	116	7346	63.25
Hong Kong	1 028	37 557	36.53	853	37 925	44.46
Indonesia	441	17 738	40.22	188	8 022	42.74
Korea, Rep of	4 952	227 001	45.84	5 426	291 604	53.74
Malaysia	504	21 588	42.81	566	29 431	51.98
Philippines	324	11 920	36.83	62	2 765	44.83
Taiwan	3 651	164 290	45.00	2 827	149 547	52.90
Vietnam	10	533	52.53	–	–	–
Other Asia	**1 536**	**71 637**	**46.64**	**1 445**	**84 796**	**58.68**
India	449	22 797	50.81	517	32 519	62.94
Israel	381	13 077	34.35	397	18 297	46.10
Pakistan	580	30 814	53.15	312	18 729	59.97
Turkey	126	4 949	39.12	219	15 251	69.57
Total Asia	**35 781**	**1 638 844**	**45.80**	**36 676**	**1 988 906**	**54.23**
Europe	**4 178**	**167 056**	**39.98**	**5 810**	**291 570**	**50.19**
Belgium/Lux	–	–	–	129	6 420	49.80
Denmark	557	19 865	35.69	188	8 916	47.40
France	470	23 187	49.35	839	40 528	48.31
Germany (FR)	163	5 517	33.84	93	4 716	50.67
Netherlands	1 678	66 215	39.45	2 745	128 307	46.74
Romania	–	–	–	61	4 077	66.32
Spain	–	–	–	132	5 348	40.37
Sweden	300	11 456	38.18	123	6 996	56.81
United Kingdom	1 010	40 816	40.40	1 499	86 260	57.56
Other Countries	**316**	**14 846**	**46.98**	**260**	**14 365**	**55.25**
Brazil	122	6 282	51.60	129	7 546	58.70
New Caledonia	165	7 400	44.75	100	5 289	52.74
United States	29	1 164	40.00	31	1530	48.67
Grand Total	**40 274**	**1 820 747**	**45.21**	**42 746**	**2 294 840**	**53.69**

(a) 53-week year

Table 31 – NSW METALLURGICAL COAL EXPORTS BY COUNTRY

Country	1988-89 (a) Quantity ('000 tonnes)	1988-89 (a) Value ($A'000)	1988-89 (a) Ave Value ($A/ tonne)	1989-90 Quantity ('000 tonnes)	1989-90 Value ($A'000)	1989-90 Ave Value ($A/ tonne)
Japan	**11 404**	**564 737**	**49.52**	**11 730**	**679 300**	**57.91**
Other North-SE Asia	**2 869**	**149 041**	**51.95**	**3 645**	**214 992**	**58.98**
China (PR)	–	–	–	116	7 346	63.25
Korea, Rep of	1 625	84 202	51.81	2 459	143 182	58.22
Taiwan	1 234	64 306	52.10	1 070	64 464	60.26
Vietnam	10	533	52.53	–	–	–
Other Asia	**1 039**	**54 861**	**52.80**	**1 048**	**66 499**	**63.45**
India	333	19 098	57.39	517	32 519	62.94
Pakistan	580	30 814	53.15	312	18 729	59.97
Turkey	126	4 949	39.12	219	15 251	69.57
Total Asia	**15 312**	**768 639**	**50.20**	**16 423**	**960 791**	**58.50**
Europe	**1 001**	**50 626**	**50.57**	**1 475**	**89 583**	**60.73**
France	364	19 349	53.10	158	9 751	61.54
Romania	–	–	–	61	4 077	66.32
Sweden	137	5 499	40.24	–	–	–
United Kingdom	500	25 777	51.55	1 255	75 755	60.36
Other Countries	**122**	**6 282**	**51.60**	**129**	**7 546**	**58.70**
Brazil	122	6 282	51.60	129	7 546	58.70
Grand Total	**16 435**	**825 547**	**50.23**	**18 027**	**1 057 919**	**58.68**

(a) 53-week year

Table 32 – NSW STEAMING COAL EXPORTS BY COUNTRY

Country	1988-89 (a) Quantity ('000 tonnes)	1988-89 (a) Value ($A'000)	1988-89 (a) Ave Value ($A/ tonne)	1989-90 Quantity ('000 tonnes)	1989-90 Value ($A'000)	1989-90 Ave Value ($A/ tonne)
Japan	**11 931**	**521 843**	**43.74**	**13 462**	**698 170**	**51.86**
Other North-SE Asia	**8 040**	**331 586**	**41.24**	**6 393**	**311 649**	**48.75**
Hong Kong	1 028	37 557	36.53	853	37 925	44.46
Indonesia	441	17 738	40.22	188	8 022	42.74
Korea, Rep of	3 327	142 799	42.92	2 967	148 422	50.03
Malaysia	504	21 588	42.81	566	29 431	51.98
Philippines	324	11 920	36.83	62	2 765	44.83
Taiwan	2 416	99 984	41.38	1 757	85 084	48.42
Other Asia	**497**	**16 776**	**33.75**	**397**	**18 297**	**46.09**
India	116	3 699	31.91	–	–	–
Israel	381	13 077	34.35	397	18 297	46.10
Total Asia	**20 468**	**870 205**	**42.52**	**20 252**	**1 028 116**	**50.77**
Europe	**3 177**	**116 431**	**36.65**	**4 335**	**201 987**	**46.60**
Belgium/Lux	–	–	–	129	6 420	49.80
Denmark	557	19 865	35.69	188	8 916	47.40
France	106	3 838	36.38	680	30 778	45.23
Germany (FR)	163	5 517	33.84	93	4 716	50.67
Netherlands	1 678	66 215	39.45	2 745	128 307	46.74
Spain	–	–	–	132	5 348	40.37
Sweden	163	5 957	36.46	123	6 996	56.81
United Kingdom	510	15 039	29.47	244	10 505	43.14
Other Countries	**194**	**8 564**	**44.14**	**131**	**6 819**	**52.05**
New Caledonia	165	7 400	44.75	100	5 289	52.74
United States	29	1 164	40.00	31	1 530	48.67
Grand Total	**23 839**	**995 200**	**41.75**	**24 718**	**1 236 921**	**50.04**

(a) 53-week year

Table 33 – NSW COKE EXPORTS BY COUNTRY

Country	1988-89 Quantity ('000 tonnes)	1988-89 Value ($A'000)	1988-89 Ave Value ($A/ tonne)	1989-90 Quantity ('000 tonnes)	1989-90 Value ($A'000)	1989-90 Ave Value ($A/ tonne)
Brazil	58	6 052	103.46	102	13 353	130.55
Chile	–	–	–	24	2 734	114.85
Colombia	0	13	158.16	0	11	na
Indonesia	5	303	59.64	–	–	–
India	83	5 441	65.60	61	5 288	86.02
Japan	22	2 914	134.01	89	12 108	136.60
Malaysia	1	107	162.38	42	4 754	114.10
Netherlands	14	682	50.08	–	–	–
New Zealand	2	285	148.96	6	770	145.49
Peru	23	1 893	81.95	–	–	–
Philippines	44	3 029	68.59	–	–	–
Singapore	4	428	121.96	10	1 523	152.30
Sri Lanka	1	138	211.88	1	154	216.09
Taiwan	0	16	143.41	–	–	–
United States	608	60 004	98.62	240	32 806	136.90
Unidentified	16	982	62.01	–	–	–
Total	**880**	**82 288**	**93.48**	**574**	**73 500**	**128.12**

Source: Australian Bureau of Statistics

Table 34 – NSW METALLURGICAL COAL EXPORTS BY TYPE BY COUNTRY

Country	Hard Coking			Soft Coking			Other		
	Quantity ('000 tonnes)	Value ($A'000)	Ave Value ($A/tonne)	Quantity ('000 tonnes)	Value ($A'000)	Ave Value ($A/tonne)	Quantity ('000 tonnes)	Value ($A'000)	Ave Value ($A/tonne)
1988-89(a)									
Japan	**2 420**	**136 415**	**56.38**	**3 044**	**157 057**	**51.59**	**5 940**	**271 265**	**45.67**
Other North-SE Asia	**533**	**30 261**	**56.77**	**1 889**	**98 270**	**52.02**	**449**	**20 510**	**45.71**
Korea, Rep of	159	8 644	54.39	1 154	61 619	53.40	312	13 939	44.61
Taiwan	374	21 617	57.85	735	36 651	49.90	126	6 038	47.89
Vietnam	–	–	–	–	–	–	10	533	52.53
Other Asia	**595**	**31 849**	**53.53**	**444**	**23 011**	**51.83**	**–**	**–**	**–**
India	313	18 127	57.90	20	970	49.35	–	–	–
Pakistan	156	8 773	56.24	424	22 041	52.02	–	–	–
Turkey	126	4 949	39.12	–	–	–	–	–	–
Total Asia	**3 548**	**198 525**	**55.95**	**5 376**	**278 338**	**51.77**	**6 389**	**291 775**	**45.67**
Europe	**825**	**43 270**	**52.42**	**–**	**–**	**–**	**176**	**7 356**	**41.86**
France	325	17 493	53.76	–	–	–	39	1 857	47.57
Sweden	–	–	–	–	–	–	137	5 499	40.24
United Kingdom	500	25 777	51.55	–	–	–	–	–	–
Other Countries	**122**	**6 282**	**51.60**	**–**	**–**	**–**	**–**	**–**	**–**
Brazil	122	6 282	51.60	–	–	–	–	–	–
Grand Total	**4 495**	**248 077**	**55.19**	**5 376**	**278 338**	**51.77**	**6 564**	**299 131**	**45.57**
1989-90									
Japan	**2 387**	**153 631**	**64.36**	**3 264**	**194 940**	**59.73**	**6 080**	**330 729**	**54.40**
Other North-SE Asia	**693**	**43 842**	**63.26**	**2 284**	**134 817**	**59.03**	**668**	**36 332**	**54.39**
China (PR)	86	5 547	64.42	30	1 799	59.90	–	–	–
Korea, Rep of	275	17 016	61.95	1 630	95 986	58.88	555	30 180	54.43
Taiwan	332	21 279	64.09	624	37 032	59.31	113	6 152	54.24
Other Asia	**736**	**47 770**	**64.90**	**312**	**18 729**	**59.97**	**–**	**–**	**–**
India	517	32 519	62.94	–	–	–	–	–	–
Pakistan	–	–	–	312	18 729	59.97	–	–	–
Turkey	219	15 251	69.57	–	–	–	–	–	–
Total Asia	**3 816**	**245 243**	**64.27**	**5 860**	**348 486**	**59.47**	**6 748**	**367 061**	**54.40**
Europe	**1 475**	**89 583**	**60.73**	**–**	**–**	**–**	**–**	**–**	**–**
France	158	9 751	61.54	–	–	–	–	–	–
Romania	61	4 077	66.32	–	–	–	–	–	–
United Kingdom	1 255	75 755	60.36	–	–	–	–	–	–
Other Countries	**16**	**968**	**58.87**	**67**	**4 074**	**60.71**	**45**	**2 503**	**55.63**
Brazil	16	968	58.87	67	4 074	60.71	45	2 503	55.63
Grand Total	**5 307**	**335 795**	**63.27**	**5 928**	**352 559**	**59.48**	**6 792**	**369 564**	**54.41**

(a) 53-week year

Table 35 – NSW COAL EXPORTS BY DISTRICTS
('000 tonnes)

District	Metallurgical					
	Hard coking	Soft coking	Other	Total metallurgical	Steaming	Total
1988-89 (a)						
Singleton-North West	–	3 798	4 377	8 175	11 102	19 278
Newcastle	–	1 578	914	2 491	2 615	5 107
West	–	–	701	701	7 733	8 434
South	4 495	–	573	5 068	2 388	7 456
NSW	**4 495**	**5 376**	**6 564**	**16 435**	**23 839**	**40 274**
1989-90						
Singleton-North West	–	4 264	4 660	8 924	12 439	21 363
Newcastle	–	1 658	1 238	2 896	2 909	5 804
West	–	6	493	499	6 626	7 125
South	5 307	–	402	5 708	2 745	8 454
NSW	**5 307**	**5 928**	**6 792**	**18 027**	**24 718**	**42 746**

(a) 53 week year

Table 36 – MONTHLY NSW COAL EXPORTS BY REGIONS
('000 tonnes)

Month	Asia			Europe	Other Countries	Total
	Japan	Other Asia	Total Asia			
STEAMING COAL						
1989						
January	924	940	1 864	411	–	2 275
February	1 248	584	1 832	240	20	2 093
March	1 086	474	1 560	–	20	1 580
April	1 086	638	1 724	289	–	2 013
May	701	634	1 335	291	–	1 626
June	1 015	868	1 883	262	44	2 189
July	1 213	401	1 614	166	–	1 780
August	1 129	704	1 833	291	20	2 145
September	811	635	1 446	188	–	1 634
October	980	291	1 271	490	–	1 761
November	1 239	388	1 627	387	20	2 034
December	1 552	452	2 004	224	31	2 260
1990						
January	1 218	598	1 816	811	20	2 647
February	1 141	325	1 466	373	–	1 838
March	1 206	661	1 867	106	21	1 993
April	1 154	815	1 969	544	20	2 535
May	851	867	1 718	256	–	1 974
June	968	651	1 619	497	–	2 117
METALLURGICAL COAL						
1989						
January	472	297	769	101	–	870
February	861	306	1 168	–	–	1 168
March	1 196	396	1 592	–	49	1 641
April	935	253	1 188	114	–	1 301
May	805	395	1 200	189	–	1 388
June	1 122	180	1 302	150	–	1 452
July	668	376	1 044	55	–	1 098
August	960	695	1 654	–	–	1 654
September	1 247	81	1 328	109	–	1 437
October	1 059	646	1 705	137	–	1 841
November	1 158	310	1 468	243	67	1 779
December	938	364	1 302	180	61	1 542
1990						
January	864	358	1 222	–	–	1 222
February	794	259	1 053	104	–	1 158
March	1 180	240	1 420	217	–	1 637
April	825	511	1 336	61	–	1 398
May	923	384	1 307	239	–	1 546
June	1 116	469	1 585	129	–	1 715
ALL EXPORTS						
1989						
January	1 395	1 236	2 631	512	–	3 144
February	2 110	890	3 000	240	20	3261
March	2 282	869	3 151	–	69	3 221
April	2 020	891	2 911	403	–	3 314
May	1 505	1 029	2 534	480	–	3 014
June	2 136	1 048	3 184	412	44	3 641
July	1 880	776	2 656	221	–	2 878
August	2 088	1 400	3 488	291	20	3 799
September	2 058	716	2 774	297	–	3 071
October	2 039	937	2 976	627	–	3 603
November	2 397	698	3 095	631	87	3 813
December	2 489	816	3 305	404	92	3 802
1990						
January	2 082	956	3 038	811	20	3 869
February	1 935	584	2 519	477	–	2 996
March	2 386	900	3 286	323	21	3 630
April	1 979	1 327	3 306	606	20	3 933
May	1 774	1 251	3 025	495	–	3 520
June	2 084	1 121	3 205	627	–	3 832

Table 37 – MONTHLY NSW COAL EXPORTS BY TYPE
('000 tonnes)

Month	Metallurgical				Steaming	Total
	Hard Coking	Soft Coking	Other	Total Metallurgical		
1989						
January	257	362	251	870	2 275	3 144
February	296	401	471	1 168	2 093	3 261
March	416	619	606	1 641	1 580	3 221
April	463	328	511	1 301	2 013	3 314
May	353	449	586	1 388	1 626	3 014
June	450	452	550	1 452	2 189	3 641
July	524	276	298	1 098	1 780	2 878
August	462	623	570	1 654	2 145	3 799
September	352	433	652	1 437	1 634	3 071
October	611	634	596	1 841	1 761	3 603
November	623	542	615	1 779	2 034	3 813
December	478	432	631	1 542	2 260	3 802
1990						
January	221	503	499	1 222	2 647	3 869
February	199	476	483	1 158	1 838	2 996
March	521	475	641	1 637	1 993	3 630
April	470	348	580	1 398	2 535	3 933
May	502	467	577	1 546	1 974	3 520
June	344	720	651	1 715	2 117	3 832

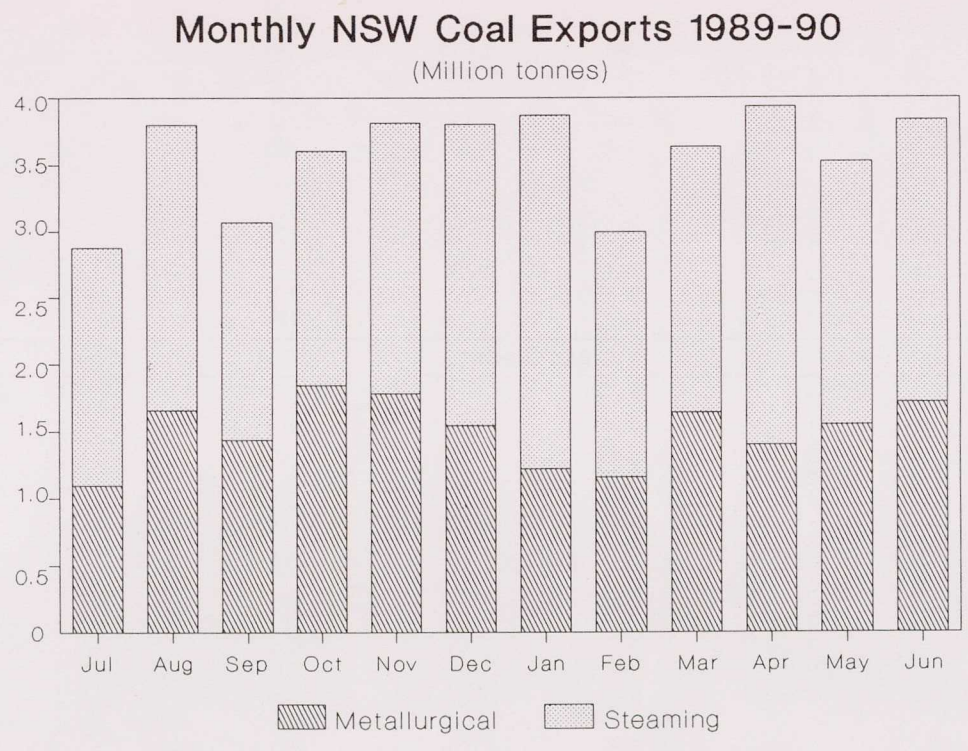


Table 38 – MONTHLY NSW COAL EXPORTS TO JAPAN
('000 tonnes)

Month	Metallurgical					
	Hard Coking	Soft Coking	Other	Total Metallurgical	Steaming	Total
1989						
January	113	127	231	472	924	1 395
February	169	289	404	861	1 248	2 110
March	259	346	591	1 196	1 086	2 282
April	323	174	438	935	1 086	2 020
May	37	246	522	805	701	1 505
June	261	310	550	1 122	1 015	2 136
July	312	85	271	668	1 213	1 880
August	165	291	503	960	1 129	2 088
September	243	352	652	1 247	811	2 058
October	245	283	530	1 059	980	2 039
November	219	419	520	1 158	1 239	2 397
December	162	221	554	938	1 552	2 489
1990						
January	221	210	434	864	1 218	2 082
February	95	236	463	794	1 141	1 935
March	205	334	641	1 180	1 206	2 386
April	184	157	484	825	1 154	1 979
May	188	250	484	923	851	1 774
June	148	426	543	1 116	968	2 084

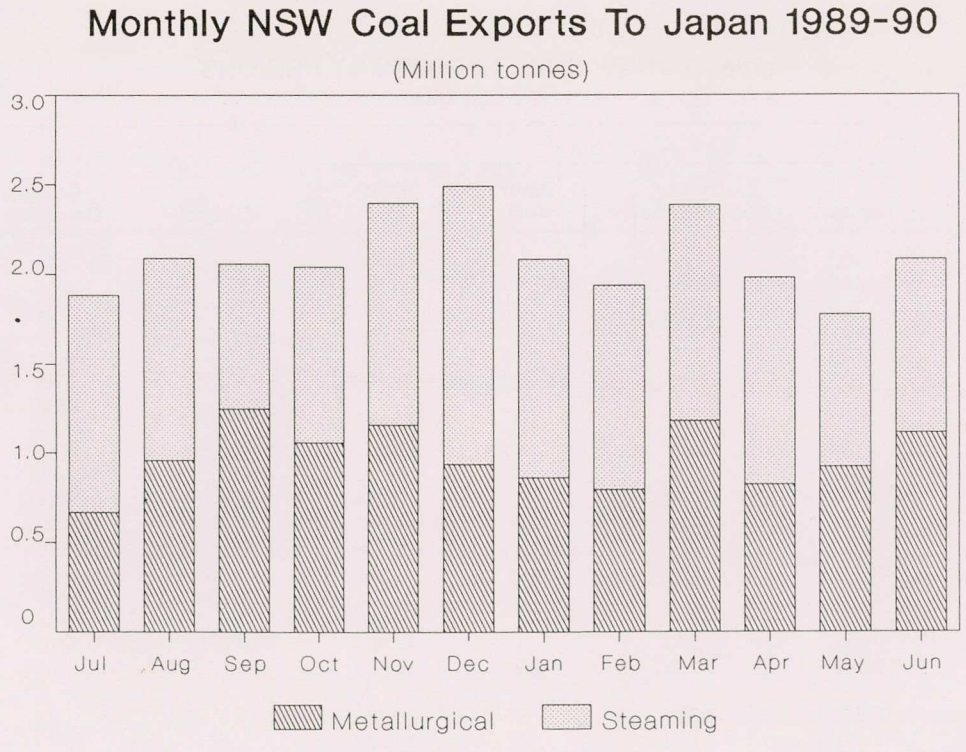


Table 39 – NSW COAL EXPORTS BY TYPE
('000 tonnes)

Year	Metallurgical					
	Hard Coking	Soft Coking	Other	Total Metallurgical	Steaming	Total
1983	4 587	9 845		14 432	16 382	30 814
1984	4 940	9 225		14 165	21 581	35 746
1985	5 951	10 891		16 842	23 860	40 702
1986	4 321	5 982	4 600	14 904	25 570	40 474
1987	3 961	4 602	6 965	15 528	27 263	42 792
1988(a)	4 573	4 908	7 438	16 920	24 976	41 896
1989	5 164	5 550	6 337	17 051	23 348	40 399
1970-71	n.a.	n.a.	n.a.	9 913	2 072	11 985
1971-72(a)	n.a.	n.a.	n.a.	10 717	1 932	12 649
1972-73	n.a.	n.a.	n.a.	10 995	173	11 168
1973-74	n.a.	n.a.	n.a.	11 730	1 001	12 731
1974-75	4 640	6 419		11 059	3 753	14 812
1975-76	4 657	6 410		11 067	2 987	14 054
1976-77 (a)	5 532	7 764		13 296	3 151	16 447
1977-78	5 583	7 897		13 480	4 257	17 737
1978-79	5 761	8 862		14 623	4 819	19 442
1979-80	6 072	9 118		15 190	6 676	21 866
1980-81	5 503	8 765		14 268	9 444	23 712
1981-82	5 055	8 776		13 831	8 459	22 290
1982-83(a)	4 655	9 287		13 942	15 197	29 139
1983-84	5 081	9 379		14 460	18 967	33 427
1984-85	5 408	10 691		16 099	22 197	38 296
1985-86	4 696	6 440	3 445	14 581	24 506	39 087
1986-87	4 164	5 357	5 947	15 468	26 721	42 189
1987-88	4 411	4 411	7 605	16 427	27 351	43 778
1988-89(a)	4 495	5 376	6 564	16 435	23 839	40 274
1989-90	5 307	5 928	6 792	18 027	24 718	42 746

(a) 53-week year

Table 40 – NSW COAL EXPORTS BY REGIONS
('000 tonnes)

Year	Asia						
	Japan	Other North-SE Asia	Other Asia	Total Asia	Europe	Other Countries	Total
1983	17 162	7 440	929	25 531	5 070	213	30 814
1984	18 491	9 007	1 094	28 592	6 893	261	35 746
1985	20 332	11 725	2 277	34 334	6 239	129	40 702
1986	19 431	10 928	1 479	31 838	8 505	129	40 474
1987	21 739	11 606	1 349	34 694	7 858	241	42 792
1988(a)	23 427	11 714	1 652	36 793	4 850	253	41 896
1989	24 361	9 886	1 420	35 667	4 398	332	40 399
1970-71	9 169	46	79	9 294	2 273	419	11 985
1971-72(a)	10 040	–	7	10 047	2 447	155	12 649
1972-73	10 690	156	–	10 846	311	11	11 168
1973-74	10 787	1 033	–	11 820	842	69	12 731
1974-75	9 951	773	74	10 798	3 438	576	14 812
1975-76	10 432	704	–	11 136	2 854	64	14 054
1976-77(a)	12 464	1 248	10	13 722	2 638	87	16 447
1977-78	11 935	1 746	–	13 681	3 421	634	17 736
1978-79	12 265	2 540	215	15 020	4 052	370	19 442
1979-80	13 849	3 136	591	17 576	4 260	30	21 866
1980-81	15 740	3 884	81	19 705	3 938	69	23 712
1981-82	14 978	3 706	705	19 389	2 861	40	22 290
1982-83(a)	16 430	6 211	1 399	24 040	5 034	65	29 139
1983-84	18 272	8 188	911	27 371	5 746	310	33 427
1984-85	19 328	10 365	1 705	31 398	6 738	159	38 296
1985-86	19 197	11 143	1 938	32 278	6 627	183	39 087
1986-87	20 538	11 149	1 429	33 116	8 919	157	42 189
1987-88	22 917	12 304	1 384	36 605	6 985	187	43 778
1988-89(a)	23 335	10 910	1 536	35 781	4 178	316	40 274
1989-90	25 193	10 038	1 445	36 676	5 810	260	42 746

(a) 53-week year

Table 41 – NSW METALLURGICAL COAL EXPORTS BY REGIONS
('000 tonnes)

Year	Asia				Europe	Other Countries	Total
	Japan	Other North-SE Asia	Other Asia	Total Asia			
1983	10 675	3 053	577	14 305	–	127	14 432
1984	10 578	2 586	521	13 685	348	132	14 165
1985	11 543	2 772	1 630	15 945	897	–	16 842
1986	10 704	2 185	1 021	13 910	995	–	14 904
1987	10 994	2 352	889	14 235	1 294	–	15 528
1988(a)	11 681	2 953	1 139	15 773	1 074	73	16 920
1989	11 419	3 273	1 024	15 716	1 158	177	17 051
1970-71	9 169	46	–	9 215	291	408	9 913
1971-72(a)	10 032	–	–	10 032	530	155	10 717
1972-73	10 690	156	–	10 846	138	11	10 995
1973-74	10 787	739	–	11 526	204	–	11 730
1974-75	9 682	604	–	10 286	453	320	11 059
1975-76	10 280	663	–	10 943	77	47	11 067
1976-77(a)	11 997	1 225	–	13 222	–	74	13 296
1977-78	11 401	1 661	–	13 062	408	10	13 480
1978-79	11 483	2 384	215	14 082	485	56	14 623
1979-80	12 203	2 396	591	15 190	–	–	15 190
1980-81	11 237	2 950	81	14 268	–	–	14 268
1981-82	10 328	2 854	475	13 657	174	–	13 831
1982-83(a)	10 058	3 123	761	13 942	–	–	13 942
1983-84	10 672	2 861	642	14 175	70	215	14 460
1984-85	11 670	2 501	1 132	15 303	751	44	16 099
1985-86	10 119	2 377	1 245	13 741	841	–	14 581
1986-87	10 973	2 387	960	14 320	1 150	–	15 468
1987-88	11 454	2 649	973	15 076	1 351	–	16 427
1988-89(a)	11 404	2 869	1 039	15 312	1 001	122	16 435
1989-90	11 730	3 645	1 048	16 423	1 475	129	18 027

(a) 53-week year

Table 42 – NSW STEAMING COAL EXPORTS BY REGIONS
('000 tonnes)

Year	Asia				Europe	Other Countries	Total
	Japan	Other North-SE Asia	Other Asia	Total Asia			
1983	6 487	4 387	352	11 226	5 070	86	16 382
1984	7 913	6 421	573	14 907	6 545	129	21 581
1985	8 789	8 953	647	18 389	5 342	129	23 860
1986	8 728	8 744	458	17 930	7 510	129	25 570
1987	10 745	9 255	461	20 461	6 564	241	27 263
1988(a)	11 746	8 762	512	21 020	3 776	180	24 976
1989	12 942	6 614	396	19 952	3 240	155	23 348
1970-71	–	–	79	79	1 982	11	2 072
1971-72(a)	8	–	7	15	1 917	–	1 932
1972-73	–	–	–	–	173	–	173
1973-74	–	294	–	294	638	69	1 001
1974-75	269	169	74	512	2 985	256	3 753
1975-76	152	41	–	193	2 777	17	2 987
1976-77(a)	467	23	10	500	2 638	13	3 151
1977-78	535	85	–	620	3 013	624	4 257
1978-79	782	156	–	938	3 567	314	4 819
1979-80	1 646	740	–	2 386	4 260	30	6 676
1980-81	4 503	934	–	5 437	3 938	69	9 444
1981-82	4 650	852	230	5 732	2 687	40	8 459
1982-83(a)	6 372	3 088	638	10 098	5 034	65	15 197
1983-84	7 600	5 327	269	13 196	5 676	95	18 967
1984-85	7 658	7 864	573	16 095	5 987	115	22 197
1985-86	9 078	8 766	693	18 537	5 786	183	24 506
1986-87	9 565	8 763	468	18 796	7 769	157	26 721
1987-88	11 463	9 655	411	21 529	5 634	187	27 351
1988-89(a)	11 931	8 040	497	20 468	3 177	194	23 839
1989-90	13 462	6 393	397	20 252	4 335	131	24 718

(a) 53-week year

EXPORT PRICES

NSW export coal is sold under a variety of contractural arrangements, ranging from evergreen or longterm contracts to spot sales. In some markets, e.g. India and Turkey, coal is purchased by tender procedures. In Japan and other SE Asian countries, the usual arrangement is a term contract (of one or more years) negotiated directly between buyer and seller. Notwithstanding the duration of a term contract, it is usual practice for price and tonnage to be reviewed annually.

Over 90% of NSW export coal is currently sold under US dollar pricing arrangements. Coking coal contracts with the Japanese steel mills have been in US dollars since 1982. Between 1976 and 1981 they were denominated in Australian dollars and prior to 1976 in US dollars. Up until the mid 1980's considerable quantities of steaming coal were sold in Australian dollars but since then there has been increasing tendency to US dollar pricing.

Due to Japan's pre-eminent position among coal importers and the NSW coal industry's significant dependence on the Japanese market (59% by tonnage, 60% by value in 1989-90), the annual contract settlements with the Japanese steel mills and power utilities largely determine the revenues flowing to NSW coal exporters. Further, the Japanese contract price settlements flow on throughout the South East Asian region which, with Japan, currently accounts for about 85% of NSW export tonnage and revenues.

Contract settlements with the Japanese steel mills for NSW hard and soft coking coals for the year commencing 1 April 1990 (JFY 1990) were concluded in January 1990. Hard coking prices were increased by US$1.90/2.40 to US$52.30/52.80. Soft coking coal prices were increased by US$2.20 to give new prices of US$49.35 for class A grade, US$48.35 for B grade, and US$47.35 for class C grade. Following conclusion of the hard and soft coking coal contracts, NSW semi-soft coking coal settlements for JFY 1990 were progressively concluded with price increases of US$1.80. New prices ranged from US$42.70 to US$44.20.

Contract settlement for JFY 1990 between NSW steaming coal suppliers and the Japanese negotiators, EPDC and Kyushu EPC, was concluded in March 1990. The benchmark price (6 700 kcal/kg coal) was increased by US$1.70 to US$40.85. The benchmark price, with adjustments for quality differentials, flows on to settlements with other Japanese power utilities and is reflected in prices for the cement, paper and pulp and other steam coal user industries.

Price movements for major contracts with the Japanese steel mills and power utilities are shown in Table 43. After a period of decline from JFY 1982 to JFY 1987, contract prices have increased in each of the last three years. Over the period JFY 1987 to JFY 1990, increases in metallurgical coal contract prices have ranged from 18.9/21.6% (US$8.30/9.30) for hard coking coals, 27.1/27.4%(US$10.10/10.60) for soft coking coals and 35.5/35.9% (US$11.20) for semi-soft coking coals. One effect of these changes has been to reduce the price differential between the various grades of metallurgical coals. For example in JFY 1987 the price differential between the prime grades of hard coking coal and soft coking coal was US$5.25; by JFY 1990 it had been reduced to US$3.45. Over the same period, the price differential between soft coking coal and semi-soft coking coal declined from US$5.75 to US$5.15.

Between JFY 1987 and JFY 1990 the benchmark steaming coal contract price rose by 38.9% (US$11.45). Following the large price increase for JFY 1988 which brought the steaming coal price to within US$1.25 of the prime semi-soft coking coal price, a price differential of US$3.00/4.00 was restored in JFY 1989 and JFY 1990.

In the absence of price escalation and currency protection clauses, which were generally removed from contracts by the late 1970's, movements in the exchange rate between the US dollar and the Australian dollar is of vital importance to NSW coal exporters. Table 44 gives Australian dollar FOB prices for hard coking coal, other metallurgical coal (soft and semi-soft coking, PCI coals, etc) and steaming coal since 1977-78. The prices in each category are weighted averages of coal sold under a variety of contractural arrangements into widely disparate markets.

The increases in US dollar contract prices for JFY 1988 and JFY 1989 were largely negated through to the March quarter of 1989 by continued appreciation of the Australian dollar to a high of 89 US cents in early February 1989. It was only with the fallback in the Australian dollar to 75 US cents by June 1989 that Australian dollar returns showed significant improvement. During 1989-90 the value of the Australian dollar ranged from 74 to 79 US cents with an average for the year of 76.7 US cents, significantly lower than the 1988-89 average of 81.4 US cents. Increased contract prices plus the lower Australian dollar resulted in a substantial rise in FOB returns to coal exporters in 1989-90. For example, the average FOB value of all coal exports increased by 18.8% to $A53.69 per tonne. However, Australian dollar returns, particularly for coking coals, remain below the levels of three to four years ago. The graphs on the adjacent page give annual average FOB prices in Australian dollars for all exports from 1972-73 to 1989-90 and for three grades (hard coking, other coking and steaming) from 1977-78 to 1989-90.

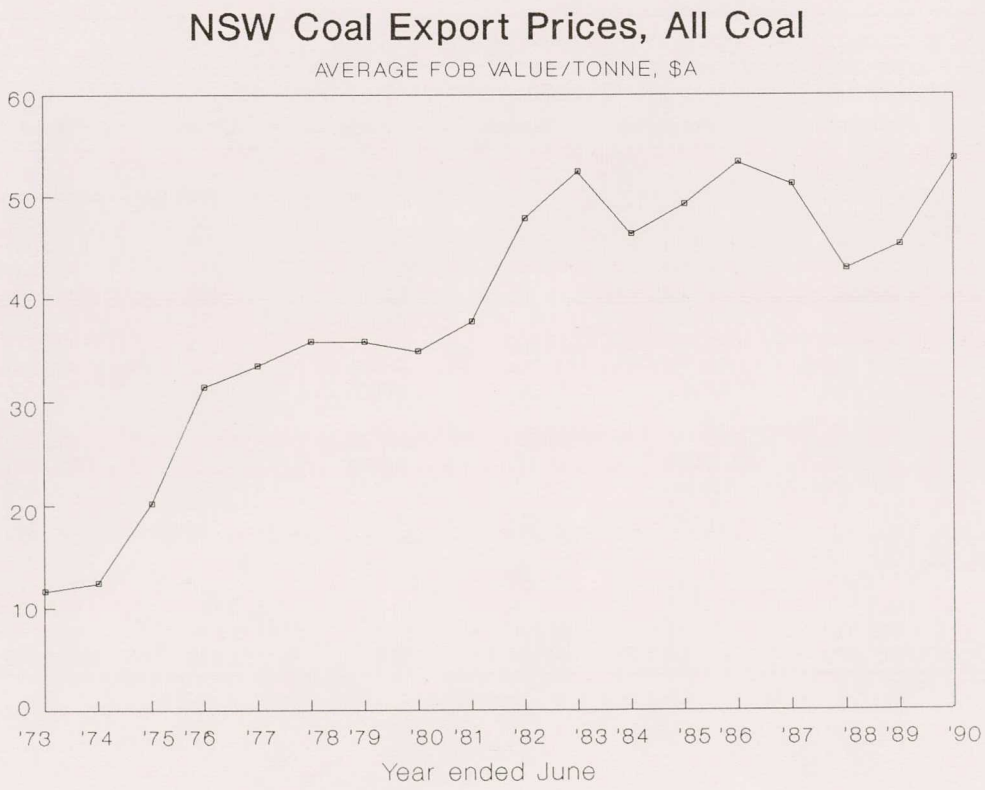
Table 43 – SUMMARY OF JAPAN/NSW COAL CONTRACT PRICES (a)

	Prices, US$/tonne				Increases, US$/tonne		
Coal type	JFY 1987	JFY 1988	JFY 1989	JFY 1990	JFY 1988	JFY 1989	JFY 1990
Hard coking	43.00/44.00	46.40/46.90	49.90/50.40	52.30/52.80	2.90/3.40	3.50	1.90/2.40
Soft coking							
A	38.75	42.65	47.15	49.35	3.90	4.50	2.20
B	37.75	41.65	46.15	48.35	3.90	4.50	2.20
C	37.25	40.65	45.15	47.35	3.40	4.50	2.20
Semi-soft coking	31.50/33.00	35.40/36.90	40.90/42.40	42.70/44.20	3.40/4.40	5.50	1.80
Steaming (b)	29.40	35.65	39.15	40.85	6.25	3.50	1.70

(a) For major contracts with the Japanese steel mills and power utilities (b) 6700 kcal/kg gross air-dry basis

Table 44 – AVERAGE FOB PRICES, NSW COAL EXPORTS
($A/tonne)

Period	Hard Coking	Other Metallurgical	Steaming	Total Exports
1977-78	44.70	37.89	23.09	35.83
1978-79	44.72	38.57	23.59	35.83
1979-80	43.14	37.75	25.77	34.94
1980-81	45.25	39.22	32.90	37.76
1981-82	55.05	48.80	43.22	47.77
1982-83	65.12	55.54	46.49	52.37
1983-84	57.80	48.21	42.32	46.23
1984-85	66.90	55.05	43.29	49.17
1985-86	70.82	59.56	47.46	53.32
1986-87	68.74	58.16	45.42	51.14
1987-88	55.24	47.46	38.83	42.85
1988-89	55.19	48.36	41.75	45.21
1989-90	63.27	56.77	50.04	53.69
1987-88 –				
Sept Qtr	56.63	47.97	39.34	42.69
Dec Qtr	56.17	48.67	39.56	44.06
Mar Qtr	54.33	47.05	38.52	42.65
June Qtr	54.17	45.77	37.69	41.80
1988-89 –				
Sept Qtr	56.00	48.10	39.51	43.94
Dec Qtr	51.90	45.95	39.94	43.10
Mar Qtr	53.00	46.66	41.27	44.04
June Qtr	59.66	53.40	47.00	50.41
1989-90 –				
Sept Qtr	63.80	56.46	49.65	53.62
Dec Qtr	61.62	55.86	49.45	53.18
Mar Qtr	62.55	56.81	50.09	53.30
June Qtr	65.35	57.99	50.92	54.68



NSW Coal Export Prices, by Type

AVERAGE FOB VALUE/TONNE, $A

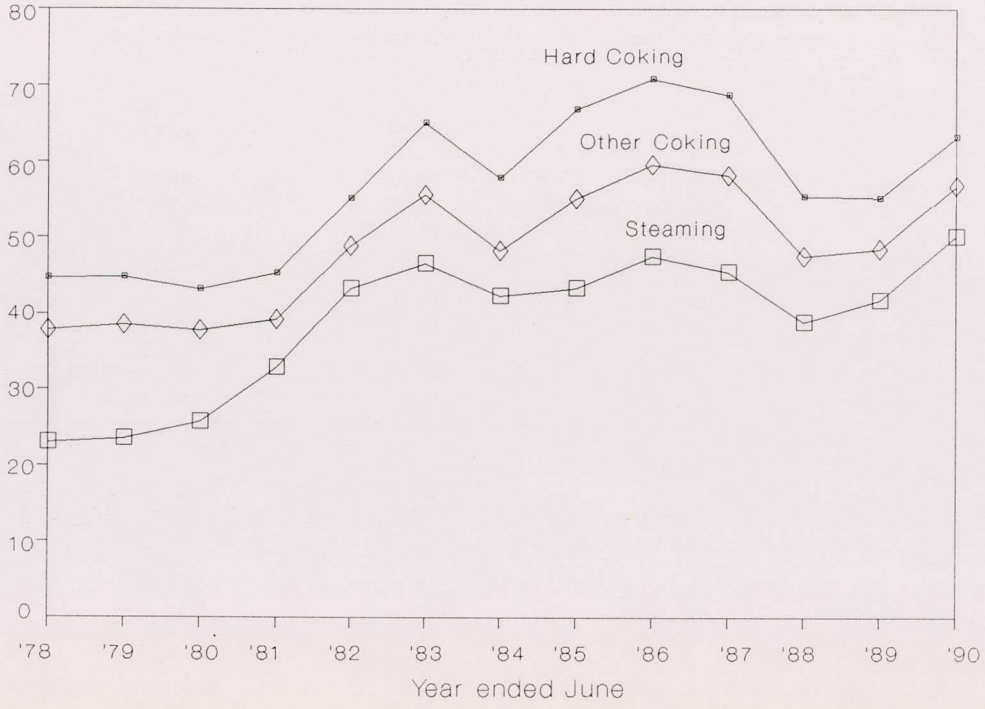


Table 45 – FOB VALUE OF NSW COAL EXPORTS

Year	Value, $A'000						Ave Value per tonne ($A)
	Japan	Rep. of Korea	Taiwan	Europe	Other	Total	
1970-71	99 085	–	352	20 351	6 113	125 901	10.40
1971-72	110 236	–	175	25 249	2 379	138 039	10.88
1972-73	125 885	1 031	185	3 726	170	130 997	11.63
1973-74	134 280	7 989	2 689	8 829	560	154 347	12.43
1974-75	220 378	14 792	3 728	52 510	14 401	305 809	20.17
1975-76	365 323	18 589	1 185	50 947	1 709	437 753	31.43
1976-77	437 537	37 674	4 410	49 440	3 228	532 289	33.47
1977-78	479 023	41 294	23 739	75 746	13 771	633 573	35.83
1978-79	501 759	54 395	39 304	92 495	20 594	708 547	35.83
1979-80	517 219	63 384	45 552	103 585	24 046	753 786	34.94
1980-81	629 311	95 733	55 300	124 077	6 401	910 822	37.76
1981-82	720 195	120 096	47 077	118 984	44 029	1 050 381	47.77
1982-83	906 125	162 388	93 732	227 143	117 267	1 506 655	52.37
1983-84	850 177	187 953	92 918	235 566	121 204	1 487 818	46.23
1984-85	1 046 889	272 420	120 873	296 350	210 402	1 946 934	49.17
1985-86	1 066 413	305 498	159 568	322 142	230 667	2 084 289	53.32
1986-87	1 114 553	283 040	147 352	414 871	197 557	2 157 373	51.14
1987-88	1 028 777	222 717	172 538	281 175	170 794	1 876 001	42.85
1988-89	1 086 580	227 001	164 290	167 056	175 819	1 820 747	45.21
1989-90	1 377 470	291 604	149 547	291 570	184 650	2 294 840	53.69

PORT FACILITIES

Coal storage area, KCL coal loader

PORT FACILITIES

New South Wales export coal is shipped through the ports of Newcastle, Sydney and Port Kembla. The combined throughput capacity of these ports is about 65.5 Mt per annum. This compares with an actual throughput of 42.75 Mt in 1989-90.

The Port of Newcastle is the outlet for coal from the Gunnedah, Hunter and Newcastle coalfields (and the Ulan mine in the Western field). It has two modern coal receival, storage, blending and loading facilities – Port Waratah Coal Services Ltd (PWCS) and Kooragang coal Loader Ltd (KCL).

PWCS and KCL currently have a combined nominal throughput capacity of 46.0 Mt made up of 28.0 Mt at PWCS AND 18.0 Mt at KCL. Total coal exports through Newcastle in 1989-90 amounted to 30.20 Mt of which PWCS handled 16.85 Mt and KCL 13.35 Mt. This was 3.6% more than the 1988-89 throughput of 29.16 Mt.

During the year PWCS and KCL merged their operations. The merger involved the purchase by PWCS of shares held in KCL by the Maritime Services Board and BHP. The other shareholders in KCL sold their shares in exchange for shares in PWCS. KCL will remain as a separate legal entity, but will be a wholly-owned subsidiary of PWCS.

Sydney has two export coal loaders – Balmain, owned and operated by the Maritime Services Board, and Balls Head owned by Coal & Allied Industries Ltd. Coal loaded through Balmain comes from the Western and Southern coalfields, while Balls Head serves one of Coal & Allied's northern mines. The combined capacity of the Sydney loaders is about 5.5 Mt (4.5 Mt for Balmain and 1.0 Mt for Balls Head). Coal exports through Sydney in 1989-90 totalled 2.82 Mt (Balmain 2.31 Mt and Balls Head 0.51 Mt).

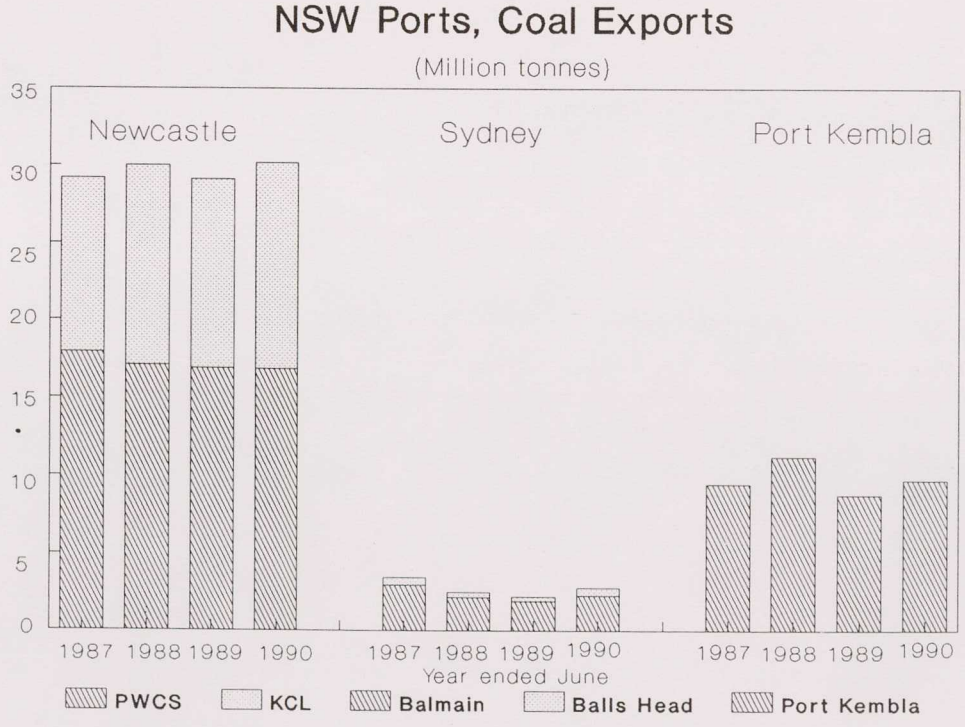
NSW COAL LOADERS

	Annual Capacity (Mt)	Exports 1989-90 (Mt)
Newcastle	**46.0**	**30.20**
PWCS	28.0	16.85
KCL	18.0	13.35
Sydney	**5.5**	**2.82**
Balmain	4.5	2.31
Balls Head	1.0	0.51
Port Kembla	**14.0**	**9.72**
Total	**65.5**	**42.74**

The present Port Kembla coal loader, south of Wollongong, was commissioned in 1982. Coal loaded through the facility comes from the Western and Southern Coalfields. Annual throughput capacity is about 14.0 Mt. Coal exports in 1989-90 amounted to 9.72 Mt.

In August 1990 Port Kembla Coal Terminal Ltd (PKCT), a consortium of coal exporters, acquired a 20-year lease of the Port Kembla coal loader from the NSW Government. PKCT has subcontracted management of the loader to BHP, one of the consortium members. In announcing the signing over of the Port Kembla leasehold, the NSW Minister for Transport also announced that the Balmain coal loader would be closed in 1993.

Profiles of the coal loaders are set out in the adjacent pages, followed by tables of port statistics.



PORT WARATAH COAL SERVICES LTD (PWCS)

PWCS is a coal assembly and shiploading facility with the capacity to receive, blend and stockpile up to 28 million tonnes of coal per annum. The facility is located at the steelworks channel of the Hunter River at Newcastle.

The PWCS facility began operations in October 1976 with a capacity of 16 million tonnes per annum. It was subsequently upgraded to its present capacity and range of facilities through major expansion programmes completed in 1982 and 1986.

Coal shipped through PWCS comes from the Gunnedah, Hunter, Newcastle and Western coalfields. Coal exports in 1989-90 amounted to 16.84 million tonnes.

Address:	Port Waratah Coal Services Ltd Port Waratah Drive CARRINGTON NSW 2294 PO Box 57 CARRINGTON NSW 2294 Telephone: (049) 69 3111 Telex: AA28288 (Answer back – PWCSL) Facsimile: (049) 69 5983
PWCS Shareholders:	% Newcastle Coal Shippers Pty Ltd 38.0 Coal & Allied Industries Ltd 32.0 Japanese Companies 27.0 Bloomfield Collieries Pty Ltd 3.0 PWCS is managed by Coal & Allied Industries Ltd.
Key Personnel:	D. Boyd – General Manager PWCS/KCL J. Carmody – Manager Coal Handling
Site area:	40 hectares
Receival stations:	
Rail	2 x 3 200 tonnes per hour
Road	30 000 tonnes per day
Ship	11 000 tonnes per day
Stockpile capacity:	700 000 tonnes (4 stockpile pads, each 1 km long by 44 metres wide)
Stackers:	4 x 2 500 tonnes per hour
Reclaimers:	4 x 2 500 tonnes per hour
Shiploaders:	3 x 2 500 tonnes per hour
Shiploader travel:	497 metres
Throughput capacity:	28 million tonnes per annum
Vessels:	
LOA	550 metres total (1 x 290m x 1 x 260m or 2 x 275m)
Beam	At least 47 metres (limited by loading machinery)
Vessel capacity:	
Minimum	10 000 DWT
Maximum	140 000 DWT dependent on shipping conditions
Approach channel depth:	15.2 metres
Depth at berth:	16.5 metres
Length of wharf:	560 metres
Length of berth:	615 metres

KOORAGANG COAL LOADER LTD (KCL)

The Kooragang coal assembly and loading terminal is located on Kooragang Island in the Hunter River at Newcastle. Kooragang is the State's newest coal loading facility. Construction commenced in 1982 and the first ship was loaded in May 1984.

The loader is planned as a phased development. Stage 1 (for which details are given below) has a loading capacity of 18 million tonnes per annum. Further development up to 50 million tonnes per annum is possible as markets expand.

Coal loaded through the Kooragang facility comes from the Gunnedah, Hunter, Newcastle and Western coalfields. Coal exports in 1989-90 amounted to 13.35 million tonnes.

Address:	Kooragang Coal Loader Ltd Curlew Street Kooragang Island NEWCASTLE NSW 2300 PO Box 306 MAYFIELD NSW 2304 Telephone: (049) 28 0300 Telex: AA28292 (Answer back – KCLNEW) Facsimile: (049) 28 0304
KCL Shareholders:	Wholly-owned by Port Waratah Coal Services Ltd KCL is managed by Coal & Allied Industries Ltd
Key Personnel:	P. Hughes – Deputy General Manager PWCS/KCL J. Manley – Manager Coal Handling
Site area:	154 hectares
Receival stations:	
Rail	1 x 6 600 tonnes per hour
Stockpile capacity:	1 600 000 tonnes theoretical capacity; 1 200 000 tonnes working capacity
Stackers:	4 x 6 600 tonnes per hour
Reclaimers:	2 x 8 000 tonnes per hour
Shiploaders:	1 x 10 500 tonnes per hour
Shiploader travel:	311 metres
Throughput capacity:	18 million tonnes per annum (Stage 1)
Vessels:	
LOA	320 metres
Beam	55 metres
Vessel capacity:	
Minimum	No minimum applicable
Maximum	250 000 DWT dependent on shipping conditions
Approach channel depth:	15.2 metres
Depth at berth:	16.5 metres
Length of berth:	311 metres

BALMAIN COAL LOADER

The Balmain coal loader, owned by the Maritime Services Board of NSW, is located in the Port of Sydney. The loader was constructed in 1963 and has since undergone several upgradings to the present annual throughput capacity of 4.5 million tonnes. Coal exported through Balmain comes from the Southern and Western coalfields. Shipments in 1989-90 amounted to 2.31 million tonnes.

Address:	Maritime Services Board of NSW Balmain Coal Loader off Sommerville Street BALMAIN NSW 2041 GPO Box 32 SYDNEY NSW 2001 Telephone: (02) 364 2111 Telex: AA72046 (Answer back – MSBSPT) Facsimile: (02) 27 7892
Key Personnel:	Murray Fox – Managing Director, Sydney Port Authority Steve Potter – Manager, Balmain Coal Loader
Receival:	1 000 tonnes per hour (rail)
Stockpile capacity:	55 000 tonnes
Reclaiming rate:	800 tonnes per hour (2 x 400)
Shiploaders:	2 x 625 tonnes per hour
Shiploader travel:	275.5 metres
Throughput capacity:	4.5 million tonnes per annum
Vessels:	
LOA	245 metres (prior advice required over 230 metres)
Beam	32.3 metres (wider beam considered on application)
Vessel capacity:	68 000 DWT maximum fully loaded
Approach channel depth:	12.2 metres (zero tide)
Depth at berth:	11.7 metres (zero tide)
Length of berth:	336 metres

BALLS HEAD COAL LOADER

The Balls Head coal loader in Sydney is owned and exclusively used by Coal and Allied Industries Ltd for shipments of coal to a specific customer in Japan.

Coal is loaded into vessels of up to 35 000 DWT at a loading rate of 2 000 tonnes per hour. Annual throughput capacity of the facility is about one million tonnes. Actual shipments in 1989-90 were 0.51 million tonnes.

PORT KEMBLA COAL LOADER

The Port Kembla coal loader is located in the Inner Harbour of Port Kembla close by the major industrial city of Wollongong 70 km south of Sydney. The facility is operated by Port Kembla Coal Terminal Ltd under lease from the NSW Government.

The present coal loader (Stage 1) was commissioned in 1982. It has an annual throughput capacity of 14 million tonnes with provision for expansion to 28 million tonnes. The Port Kembla coal loader serves the needs of export mines in the Southern and Western coalfields. Coal exports through the facility in 1989-90 were 9.72 million tonnes.

Address:

Port Kembla Coal Terminal Ltd
Port Kembla Road
INNER HARBOUR NSW 2505

PO Box 823
WOLLONGONG EAST NSW 2520

Telephone: (042) 28 0288
Telex: AA29270
Facsimile: (042) 28 7605

Shareholders:

	%
Austen & Butta Ltd	16.67
Clutha Ltd	16.67
Kembla Coal & Coke Pty Ltd	16.67
Metropolitan Collieries Ltd	16.67
Oakbridge Ltd	16.67
BHP Co Ltd	16.67

Port Kembla coal loader is managed by BHP

Key Personnel: Russell Coleman, General Manager

Receival: Rail/Road

Stockpile capacity: 600 000 tonnes (2 pads, each 1 km long by 50m wide)

Stackers: 3 x 3 700 tonnes per hour

Reclaimers: 2 x 5 000 tonnes per hour

Shiploaders: 5 000 tonnes per hour (two shiploaders, only one in operation at a time)

Shiploader travel: 235 metres (hatch coverage 250 metres)

Throughput capacity: 14 million tonnes per annum (Stage 1)

Vessels:

LOA	290 metres
Beam	45 metres (limited by loading machinery)

Vessel capacity: 140 000 DWT max fully-loaded (maximum lift 183 000 tonnes in 230 000 DWT shallow draft, wide beam vessel)

Approach channel depth: 15.25 metres

Depth at berth: 16.25 metres

Length at berth: 290 metres

Table 46 – NSW COAL EXPORTS BY PORTS
('000 tonnes)

Year	Newcastle			Sydney			Port Kembla		
	Steaming	Metall-urgical	Total	Steaming	Metall-urgical	Total	Steaming	Metall-urgical	Total
1980	4 304	8 987	13 291	2 409	1 107	3 516	1 465	4 630	6 095
1981	4 935	8 967	13 902	2 355	353	2 708	1 635	5 024	6 659
1982(a)	6 115	8 042	14 157	3 753	856	4 609	1 612	4 618	6 230
1983	9 757	9 429	19 186	4 350	631	4 981	2 275	4 372	6 647
1984	13 134	8 942	22 076	4 106	165	4 271	4 341	5 058	9 399
1985	17 129	10 033	27 162	4 211	92	4 303	2 520	6 717	9 237
1986	17 647	9 546	27 193	4 246	333	4 579	3 677	5 024	8 702
1987	19 777	9 802	29 579	2 435	182	2 617	5 051	5 544	10 596
1988(a)	19 387	10 600	29 987	2 233	146	2 379	3 355	6 174	9 529
1989	17 144	10 761	27 905	2 226	431	2 657	3 979	5 859	9 837
1970-71	1 664	5 111	6 775	336	2 282	2 618	72	2 520	2 592
1971-72(a)	1 458	5 434	6 892	335	2 276	2 611	139	3 007	3 146
1972-73	91	5 675	5 766	–	2 142	2 142	82	3 178	3 260
1973-74	912	6 685	7 597	38	1 810	1 848	51	3 235	3 286
1974-75	2 450	6 100	8 550	967	1 725	2 692	336	3 234	3 570
1975-76	1 657	6 006	7 663	778	1 584	2 362	552	3 477	4 029
1976-77(a)	1 261	7 115	8 376	856	1 893	2 749	1 034	4 288	5 322
1977-78	1 428	7 543	8 971	903	1 761	2 664	1 926	4 176	6 102
1978-79	1 812	8 934	10 746	1 253	1 482	2 735	1 754	4 207	5 961
1979-80	3 132	8 635	11 767	1 771	1 646	3 417	1 773	4 909	6 682
1980-81	5 372	8 564	13 936	2 644	642	3 286	1 428	5 062	6 490
1981-82	4 232	8 490	12 722	2 677	686	3 363	1 550	4 655	6 205
1982-83(a)	8 772	8 868	17 640	4 209	753	4 962	2 216	4 321	6 537
1983-84	11 348	9 112	20 460	4 342	292	4 634	3 277	5 056	8 333
1984-85	14 820	9 863	24 683	4 005	106	4 111	3 372	6 130	9 502
1985-86	17 231	8 979	26 210	4 513	260	4 773	2 762	5 342	8 104
1986-87	19 232	9 920	29 152	3 278	236	3 513	4 210	5 313	9 523
1987-88	20 026	10 071	30 097	2 301	228	2 529	5 024	6 128	11 152
1988-89(a)	18 483	10 673	29 156	2 153	132	2 285	3 204	5 630	8 833
1989-90	18 321	11 875	30 196	2 419	406	2 825	3 978	5 746	9 725

(a) 53-week year

Table 47 – COAL EXPORTS THROUGH NEWCASTLE, 1989-90
('000 tonnes)

Country	Metallurgical					
	Hard coking	Soft coking	Other	Total metallurgical	Steaming	Total
Japan	**–**	**3 264**	**5 346**	**8 609**	**10 288**	**18 897**
Europe	**–**	**–**	**–**	**–**	**3 230**	**3 230**
Denmark	–	–	–	–	188	188
France	–	–	–	–	564	564
Germany, FR	–	–	–	–	93	93
Netherlands	–	–	–	–	2 009	2 009
Spain	–	–	–	–	132	132
United Kingdom	–	–	–	–	244	244
Other Countries	**–**	**2 664**	**602**	**3 266**	**4 803**	**8 068**
Brazil	–	67	–	67	–	67
China(PR)	–	30	–	30	–	30
Hong Kong	–	–	–	–	853	853
Indonesia	–	–	–	–	188	188
Israel	–	–	–	–	397	397
Korea, Rep of	–	1 630	555	2 185	1 758	3 943
Malaysia	–	–	–	–	442	442
New Caledonia	–	–	–	–	100	100
Pakistan	–	312	–	312	–	312
Philippines	–	–	–	–	62	62
Taiwan	–	624	47	672	1 003	1 674
Total	**–**	**5 928**	**5 947**	**11 875**	**18 321**	**30 196**

Table 48 – COAL EXPORTS THROUGH PORT KEMBLA, 1989-90
('000 tonnes)

Country	Metallurgical				Steaming	Total
	Hard coking	Soft coking	Other	Total metallurgical		
Japan	**2 387**	**–**	**734**	**3 121**	**1 451**	**4 572**
Europe	**1 475**	**–**	**–**	**1 475**	**1 105**	**2 580**
Belgium/Lux	–	–	–	–	129	129
France	158	–	–	158	117	275
Germany(FR)	–	–	–	–	–	–
Netherlands	–	–	–	–	736	736
Romania	61	–	–	61	–	61
Sweden	–	–	–	–	123	123
United Kingdom	1 255	–	–	1 255	–	1 255
Other Countries	**1 039**	**–**	**111**	**1 150**	**1 422**	**2 573**
Brazil	16	–	45	61	–	61
India	197	–	–	197	–	197
Korea, Rep of	275	–	–	275	878	1 153
Malaysia	–	–	–	–	64	64
Taiwan	332	–	66	398	449	847
Turkey	219	–	–	219	–	219
United States	–	–	–	–	31	31
Total	**4 901**	**–**	**845**	**5 746**	**3 978**	**9 725**

Table 49 – COAL EXPORTS THROUGH SYDNEY, 1989-90
('000 tonnes)

Country	Metallurgical				Steaming	Total
	Hard coking	Soft coking	Other	Total metallurgical		
Japan	**–**	**–**	**–**	**–**	**1 723**	**1 723**
Other Countries	**406**	**–**	**–**	**406**	**696**	**1 102**
China(PR)	86	–	–	86	–	86
India	320	–	–	320	–	320
Korea, Rep of	–	–	–	–	330	330
Malaysia	–	–	–	–	60	60
Taiwan	–	–	–	–	305	305
Total	**406**	**–**	**–**	**406**	**2 419**	**2 825**

Table 50 – MONTHLY NSW COAL EXPORTS BY PORTS
('000 tonnes)

Month	Newcastle			Sydney			Port Kembla		
	Steaming	Metall-urgical	Total	Steaming	Metall-urgical	Total	Steaming	Metall-urgical	Total
1989									
January	1 612	602	2 214	152	–	152	511	267	778
February	1 595	748	2 343	193	–	193	305	420	725
March	1 266	1 131	2 397	116	45	162	198	465	663
April	1 588	672	2 260	98	25	124	327	604	931
May	1 082	944	2 026	163	32	195	381	412	793
June	1 682	936	2 618	276	–	276	232	515	747
July	1 377	462	1 839	149	82	231	254	554	808
August	1 552	1 122	2 673	187	37	224	406	495	901
September	1 189	989	2 178	218	–	218	227	448	674
October	1 301	1 127	2 427	95	114	210	365	601	966
November	1 453	1 133	2 586	274	95	368	307	552	859
December	1 489	894	2 383	305	–	305	465	648	1 113
1990									
January	2 183	985	3 168	94	–	94	370	237	606
February	1 524	877	2 400	37	–	37	278	281	559
March	1 365	1 073	2 438	336	–	336	292	564	856
April	2 037	798	2 836	154	37	192	383	562	946
May	1 271	1 044	2 315	317	–	317	386	502	889
June	1 581	1 370	2 951	253	40	293	284	304	588

Table 51 – NSW COAL EXPORTS BY PORT LOADERS
('000 tonnes)

Port Loader	1985-86	1986-87	1987-88	1988-89(a)	1989-90
Newcastle	**26 210**	**29 152**	**30 097**	**29 156**	**30 196**
Port Waratah (PWCS)(b)	17 265	17 859	17 153	16 942	16 843
Kooragang (KCL)	8 945	11 293	12 943	12 214	13 352
Sydney	**4 773**	**3 513**	**2 529**	**2 285**	**2 825**
Balmain	3 874	2 968	2 210	1 948	2 314
Balls Head	899	545	319	337	511
Port Kembla	**8 104**	**9 523**	**11 152**	**8 833**	**9 725**
NSW	**39 087**	**42 189**	**43 778**	**40 274**	**42 746**

(a) 53-week year (b) Including Basin Loader

Table 52 – NSW EXPORT COAL SHIPMENTS BY CARGO SIZE, 1989-90

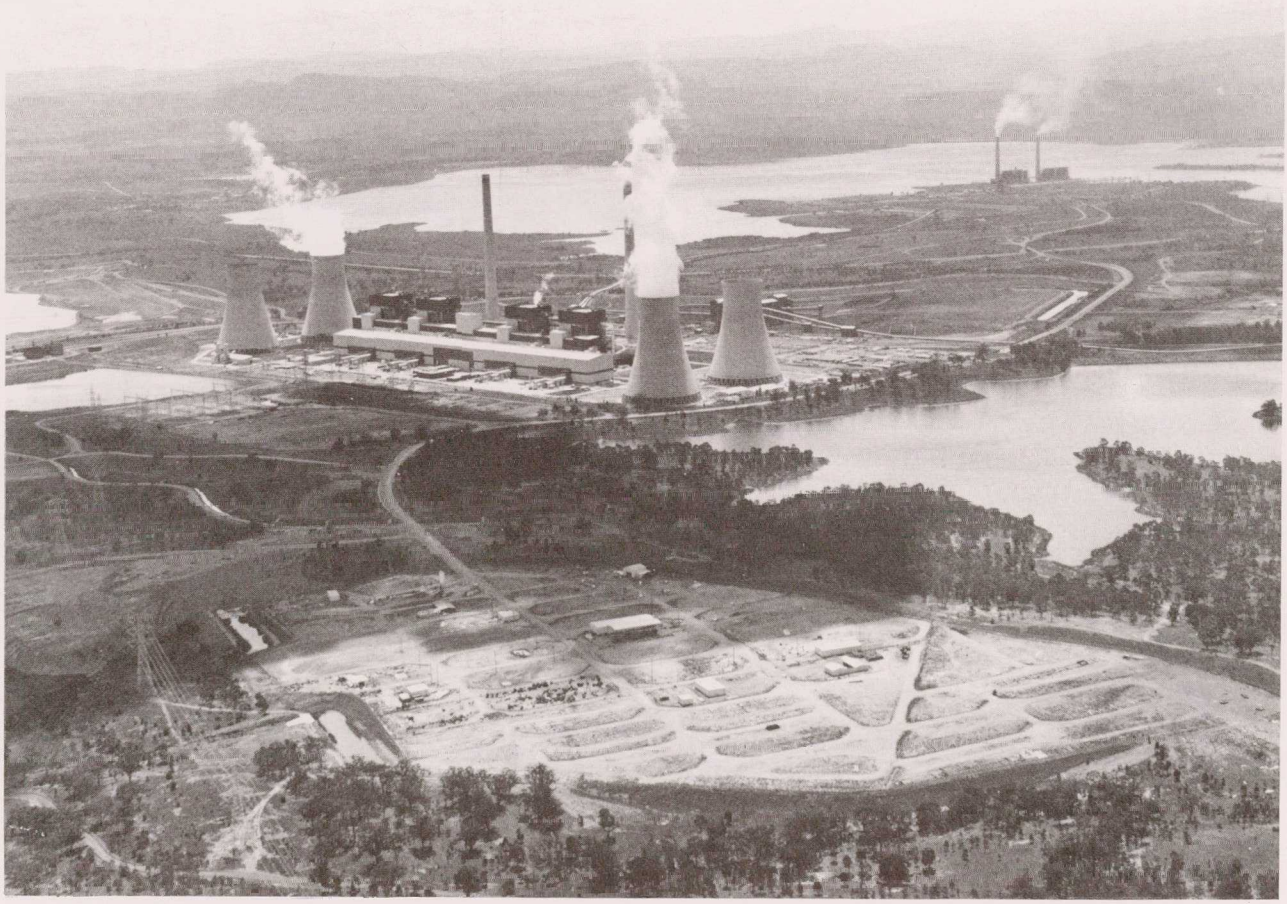
	Newcastle		Port Kembla		Sydney	
Vessel load (tonnes)	**Number of vessels**	**Tonnage ('000)**	**Number of vessels**	**Tonnage ('000)**	**Number of vessels**	**Tonnage ('000)**
Less than 10 000	2	16	1	9	–	–
10 000 – 19 999	20	349	1	16	1	19
20 000 – 29 999	21	531	10	244	5	135
30 000 – 39 999	56	2 001	15	557	22	796
40 000 – 49 999	16	695	12	506	3	136
50 000 – 59 999	48	2 718	19	1 087	13	763
60 000 – 69 999	117	7 547	26	1 664	16	977
70 000 – 79 999	11	847	4	291	–	–
80 000 – 89 999	24	2 063	4	353	–	–
90 000 – 99 999	19	1 822	5	486	–	–
100 000 – 109 999	33	3 462	10	1 057	–	–
110 000 – 119 999	12	1 387	12	1 390	–	–
120 000 – 129 999	30	3 699	10	1 237	–	–
130 000 – 139 999	15	2 067	5	689	–	–
140 000 – 149 999	7	992	1	141	–	–
Total	**431**	**30 196**	**135**	**9 725**	**60**	**2 825**
Average vessel load		70.1		72.0		47.1

Table 53 – NSW COAL EXPORTS BY DISTRICTS BY PORTS
('000 tonnes)

	1985-86	1986-87	1987-88	1988-89 (a)	1989-90
Singleton-North West	**17 158**	**19 066**	**18 739**	**19 278**	**21 363**
Newcastle	17 105	18 967	18 681	19 278	21 351
Sydney	53	91	58	–	11
Port Kembla	–	8	–	–	–
Newcastle	**5 848**	**6 731**	**6 707**	**5 107**	**5 804**
Newcastle	4 989	6 253	6 446	4 770	5 304
Sydney	859	468	261	337	500
Port Kembla	–	9	–	–	–
West	**8 467**	**8 100**	**9 504**	**8 434**	**7 125**
Newcastle	4 115	3 932	4 969	5 109	3 540
Sydney	3 093	2 283	1 693	1 602	1 838
Port Kembla	1 259	1 886	2 842	1 723	1 747
South	**7 614**	**8 291**	**8 827**	**7 456**	**8 454**
Sydney	768	671	516	346	476
Port Kembla	6 845	7 621	8 311	7 110	7 978
NSW	**39 087**	**42 189**	**43 778**	**40 274**	**42 746**

(a) 53 week year

DOMESTIC CONSUMPTION



Bayswater power station (Liddell station in background)

DOMESTIC CONSUMPTION

The domestic utilisation of NSW coal is of major importance to the NSW and Australian economies. Coal is the major indigenous energy resource in NSW and currently supplies about 55% of the State's primary energy requirements. Over 90% of electricity consumed in NSW is generated in coal-fired power stations and NSW supplies the bulk of coal supplies for the Australian steel industry. Coal is also used by the domestic cement and coke industries and for a variety of industrial and commercial boiler applications.

Consumption of coal in NSW increased from 17.18 Mt in 1970-71 to 24.36 Mt in 1980-81 and to 27.86 in 1989-90. There has been, however, some downturns in this longterm growth. Between 1980-81 and 1983-84, consumption declined as a result of a slowing down in economic activity and energy consumption in NSW and rationalisation of the domestic steel industry. From 1984-85 to 1988-89 consumption expanded again with resumption of firm growth in electricity demand and partial recovery in the coal requirements of the steel industry. Consumption fell slightly in 1989-90 with a decline in coal usage by the steel industry and a levelling off in consumption by power stations.

Steel Industry

The sole Australian steel producer, The Broken Hill Proprietary Company Limited (BHP), operates three major steelworks — at Newcastle and Port Kembla in NSW and at Whyalla in South Australia.

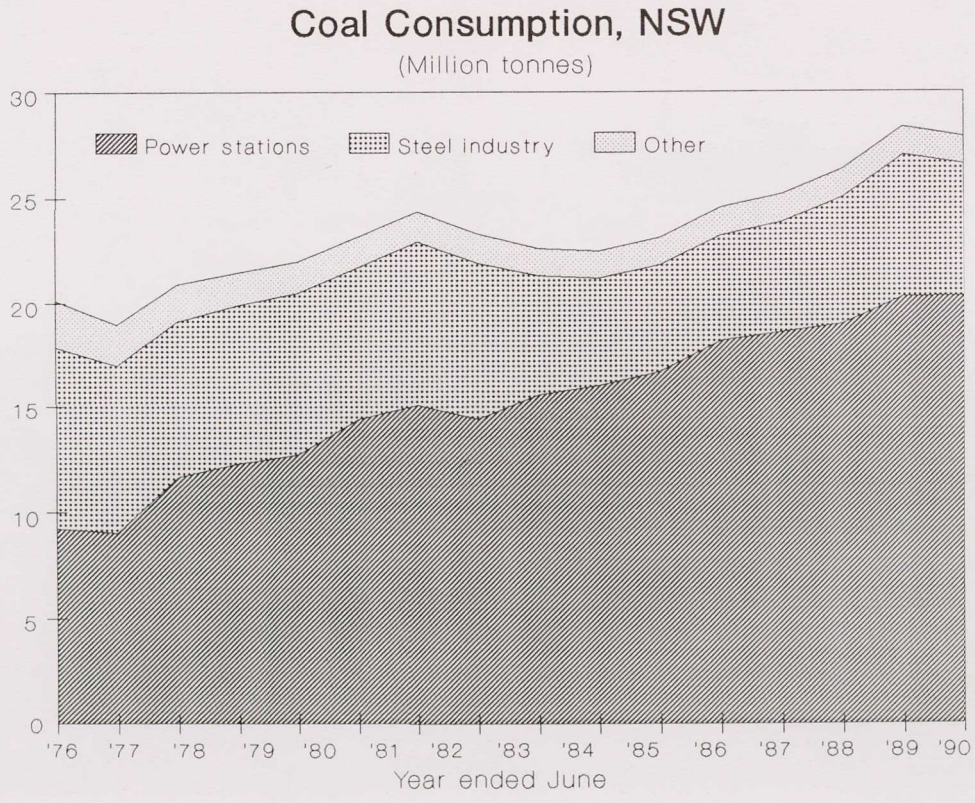
Traditionally, supplies of coal for the steelworks have been sourced mainly from BHP's captive underground mines in NSW. During 1988-89 BHP sold its Macquarie coal operations in Newcastle (the Lambton, Teralba and West Wallsend mines and the Macquarie coal preparation plant) to Pacific Copper Ltd. This left BHP with six captive underground mines in the Southern coalfield — Appin, Cordeaux, Kemira, Nebo, Tower and Wongawilli. These mines are operated by the Collieries Division, BHP Steel International Group.

In 1989-90 coal supplies to the steel industry (including the Whyalla steelworks) amounted to 9.22 Mt, 1.0% more than in the previous year. Of this total, 7.35 Mt or 79.7% was supplied from BHP-owned mines in NSW. Most of the coal from the BHP mines was delivered 'as mined' (or raw coal) and subsequently washed and blended in the steelworks' coal washeries at Port Kembla and Newcastle.

Coal delivered to the steel industry from 'outside' suppliers in 1989-90 amounted to 1.87 Mt. This was made up of 1.29 Mt from NSW, 0.42 Mt from Queensland and 0.16 Mt imported from New Zealand and Canada.

Direct intake of coal on a steelworks by steelworks basis in 1989-90 was: Newcastle 1.64 Mt, Port Kembla 7.19 Mt and Whyalla 0.39 Mt. Direct supplies to the Newcastle and Whyalla steelworks were supplemented by the transfer of washed coal from Port Kembla steelworks — 0.22 Mt to Newcastle and 0.91 Mt to Whyalla.

Not all of the coal supplied to the steelworks is used for the production of coke for domestic iron and steel production. In the 1980's, BHP developed significant export markets for steelworks' middlings (energy) coal. In 1989-90, exports of steelworks' coal (mostly from Port Kembla works) amounted to 0.67 Mt. In recent years, BHP has also developed significant export sales of coke from the steelworks surplus to blast furnace requirements. Exports of steelworks' coke amounted to about 0.70 Mt in 1988-89 and about 0.50 Mt in 1989-90.



Coal usage (on an as-received basis) by the Australian steel industry for coke making fell from just over 9 Mt in 1980-81 to around 6 Mt per annum in the mid-1980's. The decline reflected the downturn in the world steel demand in this period and the very considerable restructuring which took place within the Australian steel industry. Domestic crude steel production fell from 8 Mt in 1980 to just under 6 Mt in 1983-84. Most of the decline in coal usage occurred at the NSW steelworks. Coal consumption (on an as-received basis) at the Newcastle and Port Kembla steelworks fell from 7.9 Mt in 1980-81 to just over 5 Mt per annum in 1984-85 and 1985-86.

Coal usage by the steel industry showed a recovery from 1987. At the NSW steelworks consumption (as received) increased to 6.02 Mt in 1987-88 and to 6.72 Mt in 1988-89 before falling back to 6.28 Mt in 1989-90. Coal usage at the Whyalla works has remained relatively stable at just over 1.0 Mt per annum. Whilst there has been some increase in pig-iron and raw steel production over this period (raw steel output in 1989-90 was 6.23 Mt), most of the increase in coal usage has been associated with increased coke exports.

Because raw coal forms a large part of the coal intake of the steel industry, coal consumption by the steelworks has been expressed historically on an as-received basis. Coal consumption on a clean coal basis at the NSW steelworks was 5.15 Mt in 1988-89 and 4.70 Mt in 1989-90. This covers coal used for the production of coke for both domestic blast furnace requirements and for export sales.

Electricity Generation

The growth in coal consumption in NSW in the 1970's and 1980's has been directly linked to growth in coal usage for electricity generation. Coal consumption at power stations rose from 7.36 Mt in 1970-71 to 15.06 Mt in 1980-81 and to 20.28 Mt in 1989-90.

About 95% of the State's electricity generating capacity is operated by the Electricity Commission of NSW. Coal-fired power stations, located on the coalfields, are the mainstay of the Commission's generating system. Currently, the Commission operates six coal-fired stations. These have an aggregate generating capacity rating of about 11 500 MW.

About half of the State's electricity output is produced in the commission's newest coal-fired stations – Eraring in the Newcastle coalfield and Bayswater in the Hunter coalfield. Each of these stations has a capacity rating of 2 640 MW (4 x 660 MW units). Other operating coal-fired stations are Liddell (2 000 MW) in the Hunter coalfield, Munmorah (1200 MW) and Vales Point (1 970 MW) in the Newcastle coalfield and Wallerawang (1 120 MW) in the Western coalfield. Construction of the new coal-fired Mount Piper power station near Lithgow is proceeding with the first unit scheduled for commissioning in 1993.

Table 54 – COAL CONSUMPTION IN NSW
('000 tonnes)

Year	Power stations	Iron & Steel industry (a)	Coke works (b)	Cement industry	Other	Total
1980	14 934	7 071	285	429	721	23 440
1981	14 815	7 807	283	449	676	24 030
1982(c)	14 938	6 984	264	454	645	23 285
1983	15 515	4 928	282	349	615	21 689
1984	16 392	5 204	277	380	647	22 900
1985	17 516	5 137	286	396	650	23 985
1986	18 456	5 247	287	402	630	25 022
1987	18 560	5 617	308	395	615	25 495
1988(c)	19 927	6 381	324	421	631	27 684
1989	19 815	6 349	310	414	597	27 485
1970-71	7 357	7 075	484	549	1 716	17 181
1971-72(c)	8 333	6 959	387	536	1 515	17 730
1972-73	8 864	8 008	424	595	1 279	19 170
1973-74	8 938	8 006	340	596	1 230	19 110
1974-75	9 246	8 618	399	670	1 167	20 100
1975-76	9 047	7 947	346	553	1 077	18 970
1976-77(c)	11 692	7 421	318	453	1 022	20 906
1977-78	12 328	7 578	271	390	913	21 480
1978-79	12 732	7 747	258	430	813	21 980
1979-80	14 421	7 297	279	426	762	23 185
1980-81	15 063	7 868	286	450	693	24 360
1981-82	14 422	7 484	258	449	667	23 280
1982-83(c)	15 561	5 740	290	378	626	22 595
1983-84	15 973	5 214	285	361	633	22 466
1984-85	16 665	5 150	271	394	647	23 127
1985-86	18 143	5 063	279	417	646	24 548
1986-87	18 555	5 288	301	390	619	25 153
1987-88	18 959	6 022	324	401	616	26 322
1988-89(c)	20 269	6 722	321	421	594	28 327
1989-90	20 282	6 279	316	411	570	27 858

(a) As received basis (b) Outside steelworks (c) 53-week year

Coal supplies for the Commission's power stations in 1989-90 were obtained from:

- captive underground mines operated by the commission's coal companies Elcom Collieries Pty Ltd (Liddell State, Awaba State, Munmorah State, Newstan, Newvale, Newvale No 2 and Wyee State), and Newcom Collieries Pty Ltd (Cooranbong, Myuna and Angus Place).
- Ravensworth and Swamp Creek open cuts operated by Costain Australia Ltd and Hebden Mining Co respectively under contract to the Commission on Commission leases, and
- privately-owned coal mines under term contracts. In 1989-90 private suppliers were Novacoal Australia Pty Ltd (Howick and Western Main mines), Drayton Coal Pty Ltd (Drayton), Bayswater Colliery Co Pty Ltd (Bayswater), Muswellbrook Coal Co Ltd (Muswellbrook), Coal & Allied Industries Ltd (Chain Valley), BCSC Collieries Pty Ltd (Charbon and Ivanhoe) and Hartley Valley Coal Co Pty Ltd (Blue Mountains).

The total intake of coal by public electricity authorities in 1989-90 (including North West County Council) was 22.09 Mt of which 22.01 Mt was supplied to Electricity Commission's power stations. This was 2.65 Mt or 13.7% more than in 1988-89. Of the coal delivered to the Commission's stations –

- 51.1% was supplied by the Commission's coal companies,
- 27.0% by Ravensworth and Swamp Creek, and
- 21.9% by privately-owned mines

The North West County Council, based at Inverell, operates the small Ashford power station supplying electricity in the northern part of NSW. Coal supplies are currently obtained from Queensland.

In 1989-90, coal supplies to power stations (22.09 Mt) exceeded consumption (20.28 Mt) and coal stocks rose from 5.88 Mt to 7.68 Mt over the year. At current levels of usage, stocks at June 1990 were equivalent to about 4.5 months' consumption.

In February 1990 the Electricity Commission awarded coal supply contracts for Bayswater and Liddell power stations to replace coal currently obtained from Bayswater Colliery Co Pty Ltd and Hebden Mining Co (Swamp Creek mine) under contracts due to be completed in 1991. Successful tenderers were Novacoal Australia Pty Ltd (Howick mine), Bayswater, Drayton Coal Pty Ltd and the Narama Joint Venture. The latter is a new project located near Singleton being developed by Costain Australia Ltd and Renison Goldfields Consolidated (RGC) Ltd. Narama's contract with the Commission calls for the supply of 2.0 Mt per annum for a period of 20 years with first deliveries scheduled to commence in January 1993.

Reference is made in the Production section of the yearbook to the proposed sale of the Electricity Commission's Huntley and Liddell State mines. At the time of writing this report no decision had been announced regarding plans (first announced in September 1989) for the privatization and restructuring of the Commission's other coal mines.

Other Consumers

Coal usage in NSW other than for electricity generation and by the steel industry declined sharply during the 1960's and 1970's as a result of the substitution of fuel oil, diesel fuels and natural gas in traditional coal markets – railways, town gas, brickworks, paper/pulp making and a range of other industrial applications. Between 1960-61 and 1980-81, annual coal consumption by 'other consumers' fell from 4.62 Mt to 1.41 Mt. By 1989-90, annual consumption had declined to 1.3 Mt.

Currently, the main users of coal in NSW other than power stations and the steel industry are the coke and cement industries. There are two coke works in NSW – Corrimal Coke and Illawarra Coke near Wollongong. Both are owned by the coal producer Kembla Coal and Coke Pty Ltd (KCC) and draw coal supplies from KCC's West Cliff and Coal Cliff mines. Coal consumption in 1989-90 was 0.32 Mt.

Coal consumption by the cement industry in 1989-90 was 0.41 Mt. Three cement works (Berrima, Maldon and Portland) are operated by Blue Circle Southern Cement Ltd. Coal supplies are drawn from Blue Circle's subsidiary coal company BCSC Collieries Pty Ltd (Berrima, Charbon and Ivanhoe mines). A fourth cement works is operated by Australian Cement Ltd at Kandos with coal supplied by the company's Kandos mine.

Coal consumption by the remaining coal users in NSW in 1989-90 was 0.57 Mt. Most of this coal was used by the food processing industries including brewing and sugar refining, chemical industry, hospitals and the paper/pulp industry.

DOMESTIC CONSUMPTION

NSW Coal, 1989-90

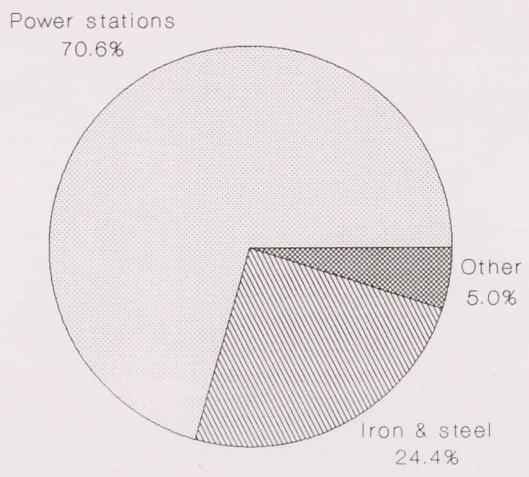


Table 55 – COAL SUPPLY & USAGE, POWER STATIONS, NSW
('000 tonnes)

	1985-86	1986-87	1987-88	1988-89(a)	1989-90
Opening stocks	**6 479**	**4 689**	**6 108**	**6 760**	**5 875**
Receipts, by producing areas:					
Singleton-North West	5 917	8 547	8 867	8 093	10 271
Newcastle	8 226	9 431	8 913	9 171	9 938
West	1 800	1 475	1 601	1 755	1 798
South	402	532	233	294	–
Queensland (b)	–	–	–	70	82
Total receipts	**16 345**	**19 985**	**19 614**	**19 384**	**22 089**
From Electricity Commission mines	9 185	10 999	10 568	10 729	11 237
From sub-contractors (c)	5 100	4 253	5 171	4 437	5 946
From private mines	2 060	4 733	3 875	4 218	4 906
Consumption, by stations:					
Bayswater	2 777	5 176	4 514	5 860	6 158
Eraring	4 212	4 544	4 537	5 045	4 899
Liddell	3 591	3 087	3 407	2 872	3 098
Munmorah	1 768	1 582	1 373	1 530	1 397
Tallawarra	496	322	399	333	16
Vales Point	2 891	2 592	2 760	2 628	2 751
Wallerawang	2 302	1 146	1 882	1 917	1 895
Others(d)	106	106	87	84	68
Total consumption	**18 143**	**18 555**	**18 959**	**20 269**	**20 282**
Closing stocks	**4 689**	**6 108**	**6 760**	**5 875**	**7 681**

(a) 53-week year (b) Supplied to Ashford power station (c) Ravensworth and Swamp Creek (d) North West County Council's Ashford power station and the Electricity Commission's Wangi power station (to 1985-86).

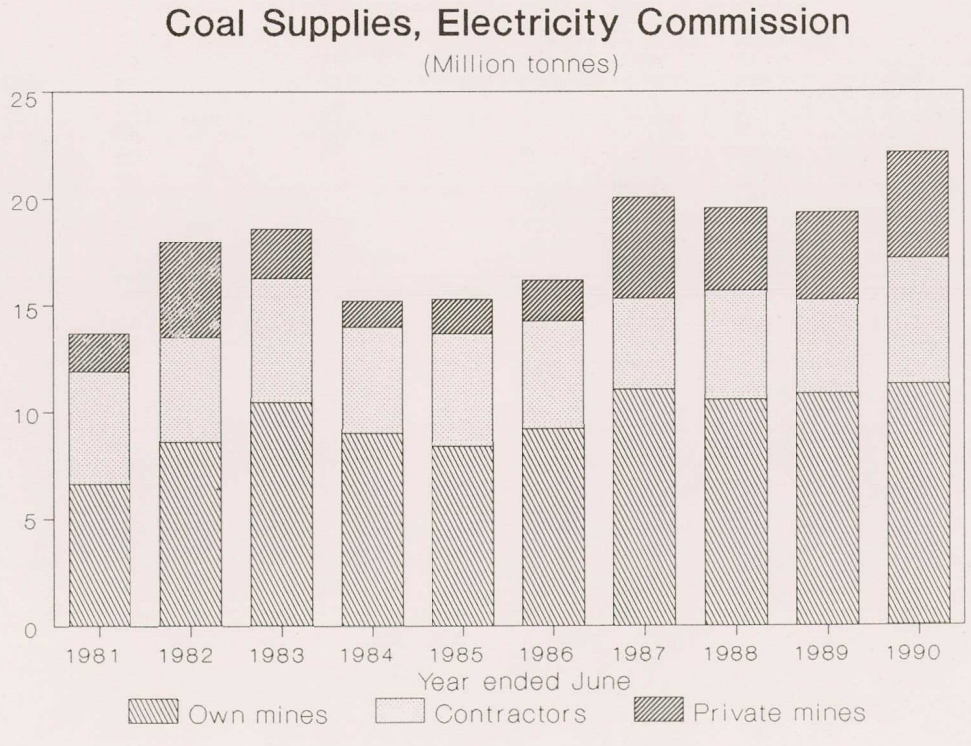


Table 56 – COAL SUPPLY & USAGE, STEEL INDUSTRY, 1989-90
('000 tonnes)

	New South Wales Steelworks				
	Newcastle	Port Kembla	Total NSW	Whyalla Steelworks	Total Australia
Opening stocks	89	573	662	89	751
Receipts, by source (a)					
NSW	1 551	7 063	8 614	23	8 637
Queensland	55	–	55	368	423
Canada	32	97	129	–	129
New Zealand	–	34	34	–	34
Total receipts	1 638	7 194	8 832	391	9 223
From steel industry mines	372	6 980	7 352	–	7 352
From other mines	1 266	214	1 480	391	1 871
Sales, clean coal	26	673	699(b)	–	699(b)
Transfers of clean coal between steelworks	+219	–1 125	–906	+906	–
Consumption, clean coal	1 381	3 319	4 700	1 154	5 854
Consumption, as-received	1 720	4 559	6 279	1 154	7 433
Closing stocks	200	1 268	1 468	232	1 700

(a) Direct from mines (b) Includes 668 000 tonnes of overseas exports

Table 57 – COAL STOCKS HELD BY CONSUMERS, NSW
('000 tonnes)

	Power stations	Iron & Steel industry	Cement industry	Other	Total
At June:					
1980	3 161	557	73	66	3 857
1981	1 923	672	160	56	2 811
1982	5 616	568	91	47	6 322
1983	8 525	983	116	45	9 669
1984	7 798	784	78	44	8 704
1985	6 479	766	111	42	7 398
1986	4 689	972	73	36	5 770
1987	6 108	1 247	104	41	7 500
1988	6 760	460	111	42	7 373
1989	5 875	662	120	30	6 687
1990	7 681	1 468	123	32	9 304
1988:					
March	7 447	598	117	42	8 204
June	6 760	460	111	42	7 373
Sept	6 854	948	123	45	7 970
Dec	6 661	755	125	39	7 580
1989:					
March	6 383	499	124	36	7 042
June	5 875	662	120	30	6 687
Sept	6 442	1 168	127	33	7 770
Dec	7 706	825	134	37	8 702
1990:					
March	8 234	1 078	132	33	9 477
June	7 681	1 468	123	32	9 304

EMPLOYEES

Underground transporter, Newvale colliery

EMPLOYMENT

NSW coal industry employment figures compiled by the Joint Coal Board cover all employees working in or about a coal mine or coal preparation plant in connection with its operation whether employed by the mine operator or by a contractor. Excluded from the Board's coverage are contract employees engaged in development work such as the driving of drifts or shafts and workers engaged in the transport of coal from mines and preparation plants to market.

The NSW coal industry has experienced a number of cycles in the level of employment over the last decade. Industry employment reached a post war peak of 21 091 in May 1982. Between May 1982 and March 1985 it fell by 11.8% to 18 605. This was primarily brought about by a downturn in Australian and Japanese steel production and a resulting decline in demand for NSW coking coal. The Southern district, the source of NSW hard coking coals, was particularly hard hit by mine rationalisations during the period and employment in the South fell by 34.7%, from 7 812 to 5 101.

Between March 1985 and December 1986 industry employment showed a firm recovery, rising to 20 127. From December 1986, however, the industry experienced a further severe downturn in employment with the number employed falling by 3 469 or 17.2% through to December 1988. Reference is made in the previous yearbook to the financial difficulties experienced by the NSW coal industry in 1987 and 1988, leading to widespread rationalisation in the industry, including the closure of 12 export mines and 15 mines in all. Between December 1986 and December 1988, employment at underground mines fell by 20.6% from 15 659 to 12 434 and open cut employment fell by 5.5% from 4 468 to 4 224. All mining districts experienced a decline in employment during this period, ranging from 26.2% in the West to 11.5% in the South.

Following the award restructuring decision of the Coal Industry Tribunal in September 1988 and improved world coal trade conditions, general employment prospects in the industry improved during the early part of 1989 with some 700 additional workers engaged from the introduction of rostered 6 and 7 day working at a number of mines. However, a major rationalisation at the Liddell mine reduced overall employment growth. At the end of June 1989 industry employment stood at 17 178, 520 more than at December 1988.

Between June 1989 and June 1990, employment in the industry increased by 0.8% to 17 313. Further employment gains flowing from restructuring and production expansions were largely offset by the closure of Huntley mine and rationalisations at some other underground mines.

EMPLOYMENT, NSW COAL MINES

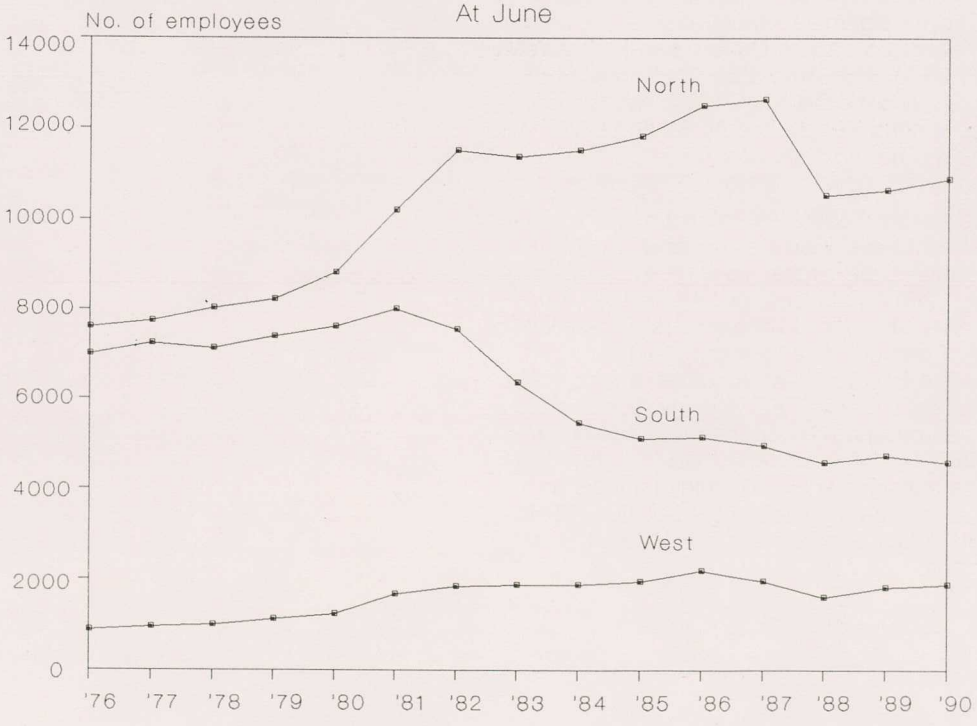
	June 1989	June 1990
Underground mines	**12 626**	**12 372**
Singleton-NW	1 475	1 381
Newcastle	4 924	4 871
West	1 496	1 543
South	4 731	4 577
Open cuts	**4 552**	**4 941**
All mines	**17 178**	**17 313**

Table 58 – EMPLOYMENT, NSW COAL MINES

As at:	Singleton North West	Newcastle	West	South	Total	Underground Mines	Open Cuts
1980 : June	2 788	6 044	1 230	7 617	17 679	16 256	1 423
: Dec	2 889	6 285	1 417	7 797	18 388	16 840	1 548
1981 : June	3 281	6 907	1 669	8 010	19 867	18 012	1 855
: Dec	3 770	7 235	1 754	7 946	20 705	18 431	2 274
1982 : June	4 156	7 358	1 840	7 557	20 911	18 299	2 612
: Dec	4 425	7 290	1 929	7 030	20 674	17 680	2 994
1983 : June	4 466	6 898	1 864	6 373	19 601	16 500	3 101
: Dec	4 678	6 698	1 878	5 838	19 092	15 836	3 256
1984 : June	4 875	6 631	1 862	5 469	18 837	15 361	3 476
: Dec	5 038	6 520	1 861	5 206	18 625	14 998	3 627
1985 : June	5 302	6 523	1 945	5 106	18 876	15 005	3 871
: Dec	5 648	6 588	2 052	5 132	19 420	15 295	4 125
1986 : June	5 903	6 596	2 179	5 142	19 820	15 469	4 351
: Dec	6 154	6 641	2 218	5 114	20 127	15 659	4 468
1987 : June	6 064	6 570	1 955	4 959	19 548	15 152	4 396
: Dec	5 388	5 757	1 695	4 602	17 442	13 358	4 084
1988 : June	5 396	5 116	1 602	4 574	16 688	12 587	4 101
: Dec	5 503	4 994	1 636	4 525	16 658	12 434	4 224
1989 : June	5 625	5 006	1 816	4 731	17 178	12 626	4 552
: Dec	5 911	4 986	1 852	4 545	17 294	12 343	4 951
1990 : June	5 922	4 952	1 862	4 577	17 313	12 372	4 941
Ave. Employment							
1988-89	5 514	5 012	1 685	4 588	16 799	12 520	4 279
1989-90	5 855	4 968	1 844	4 553	17 220	12 352	4 869

Employment, NSW Coal Mines

Employment, NSW Coal Mines By Regions



Of the 12 372 employees at underground mines at June 1990, 9 074 or 73.3% were classified as below ground workers (i.e. duties performed chiefly below ground) and 3 298 or 26.7% as surface workers (including administration). Of the below ground workers, 4 405 were classed as face workers.

There is considerable variation in individual coal mine employment in NSW. For example, at June 1990 the smallest underground mine employed 22 workers and the largest 638. Average employment per mine for all underground mines was 230. For longwall mines, it was 352 with a range from 183 To 638. For non-longwall mines, average employment size was 168 with a range from 22 to 394. Employment at open cut mines also varies greatly, from a low of 6 to a high of 678 with an average of 291.

AVERAGE MINE EMPLOYMENT

	June 1989	June 1990
Underground mines	**241**	**230**
Longwall mines	366	352
Others	168	168
Open cut mines	**262**	**291**
All mines	**246**	**245**

UNION MEMBERSHIP NSW COAL INDUSTRY EMPLOYEES

	April 1989	June 1990
Miners' Federation (a)	6 405	—
Mechanics (a)	2 068	—
UMFA (a)	—	9 179
ETU	881	790
AMWU	2 277	2 088
FEDFA	1 307	1 417
Deputies	1 027	1 043
Staff (ACSA)	1 980	2 168
Others	350	253
Total (b)	**16 296**	**16 938**

(a) Miners' Federation and Mechanics amalgamated in 1989 to form United Mineworkers' Federation of Australia (UMFA).
(b) Excludes some contract workers and some employees at central administrative offices.

Employees in the coal mining industry in NSW are organised into six unions. These are the United Mineworkers' Federation of Australia (UMFA), The Electrical Trades Union (ETU), The Amalgamated Metal Workers' Union (AMWU), The Federated Engine Drivers and Fireman's Association (FEDFA), The Australian Collieries Staff Association (ACSA) and the Colliery Officials Association. The United Mineworkers' Federation, ACSA and Colliery Officials Association are coal industry unions, while the FEDFA, ETU and AMWU have multi-industry coverage.

The United Mineworkers' Federation, formed by the amalgamation of the Miners' Federation and the Mine Mechanics in 1989, is the largest union in the industry covering some 9 200 employees, or 54% of the workforce, at June 1990. The United Mineworkers' Federation covers a range of production, engineering and transport classifications. The ETU and AMWU cover a range of tradesmen classifications. The FEDFA is involved mainly at open cut mines covering the operators of equipment such as draglines, shovels, dozers, loaders, etc. The ACSA covers line management up to under manager and a wide variety of clerical and technical positions. The Colliery Officials Association covers mine deputies at underground mines.

Employment by Union
NSW Coal Mines, June 1990

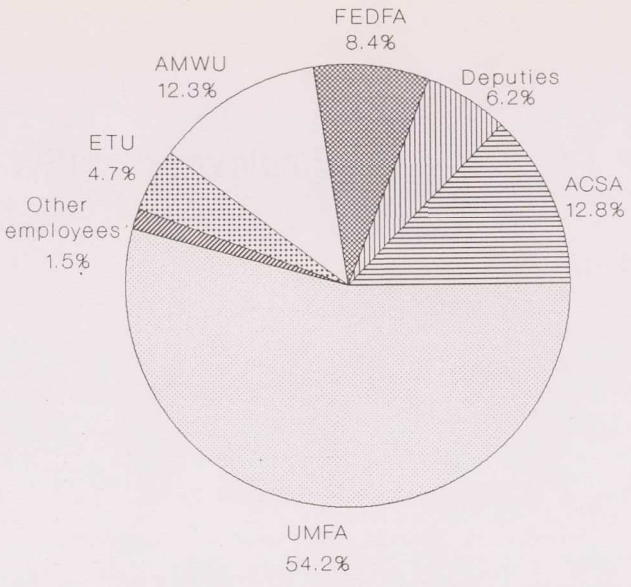


Table 59 – EMPLOYMENT AT UNDEGROUND AND OPEN CUT COAL MINES, NSW

End of June	Singleton-North West	Newcastle	West	South	Total
		UNDERGROUND MINES			
1980	1 517	5 899	1 223	7 617	16 256
1981	1 640	6 749	1 613	8 010	18 012
1982	1 776	7 204	1 762	7 557	18 299
1983	1 674	6 733	1 720	6 373	16 500
1984	1 736	6 471	1 685	5 469	15 361
1985	1 840	6 362	1 697	5 106	15 005
1986	1 949	6 450	1 928	5 142	15 469
1987	2 048	6 442	1 703	4 959	15 152
1988	1 620	5 040	1 353	4 574	12 587
1989	1 475	4 924	1 496	4 731	12 626
1990	1 381	4 871	1 543	4 577	12 372
		OPEN CUT MINES			
1980	1 271	145	7	–	1 423
1981	1 641	158	56	–	1 855
1982	2 380	154	78	–	2 612
1983	2 792	165	144	–	3 101
1984	3 139	160	177	–	3 476
1985	3 462	161	248	–	3 871
1986	3 954	146	251	–	4 351
1987	4 016	128	252	–	4 396
1988	3 776	76	249	–	4 101
1989	4 150	82	320	–	4 552
1990	4 541	81	319	–	4 941

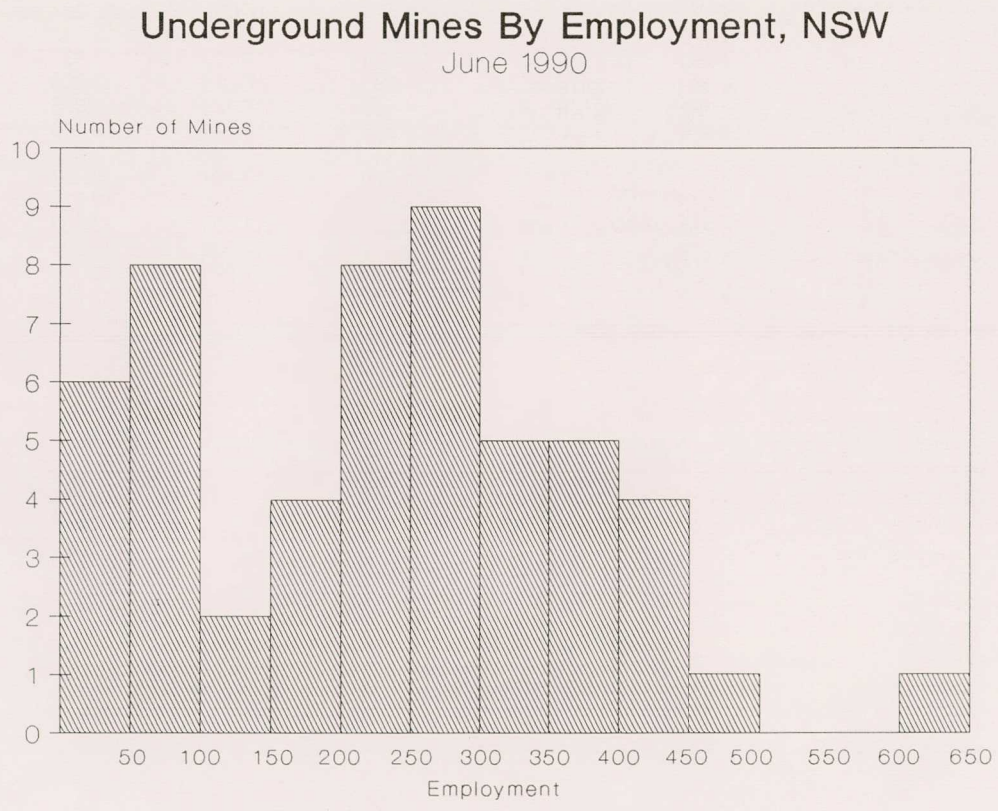


Table 60 – BELOW GROUND & SURFACE EMPLOYMENT, NSW UNDERGROUND COAL MINES

	Below ground			Surface			
End of June	Face	Elsewhere	Total	General	Administrative and clerical	Total	Total
1980	4 920	6 633	11 553	3 013	1 690	4 703	16 256
1981	5 383	7 503	12 886	3 278	1 848	5 126	18 012
1982	5 599	7 378	12 977	3 334	1 988	5 322	18 299
1983	5 182	6 369	11 551	3 055	1 894	4 949	16 500
1984	5 234	5 431	10 665	2 847	1 849	4 696	15 361
1985	5 103	5 296	10 399	2 780	1 826	4 606	15 005
1986	5 466	5 312	10 778	2 877	1 814	4 691	15 469
1987	5 323	5 386	10 709	2 669	1 774	4 443	15 152
1988	4 166	4 792	8 958	2 065	1 564	3 629	12 587
1989	4 459	4 716	9 175	1 964	1 487	3 451	12 626
1990	4 405	4 669	9 074	1 837	1 461	3 298	12 372

Table 61 – MONTHLY EMPLOYMENT, NSW COAL MINES

End of month	Singleton North West	Newcastle	West	South	Total	Underground mines	Open cuts
1989							
January	5 557	4 971	1 666	4 529	16 723	12 414	4 309
February	5 584	4 969	1 714	4 569	16 836	12 503	4 333
March	5 616	5 007	1 728	4 589	16 940	12 566	4 374
April	5 484	5 017	1 756	4 687	16 944	12 492	4 452
May	5 558	5 018	1 787	4 716	17 079	12 569	4 510
June	5 625	5 006	1 816	4 731	17 178	12 626	4 552
July	5 670	4 981	1 821	4 529	17 001	12 367	4 634
August	5 742	4 970	1 826	4 522	17 060	12 320	4 740
September	5 797	4 963	1 840	4 529	17 129	12 332	4 797
October	5 817	4 969	1 835	4 533	17 154	12 328	4 826
November	5 864	4 982	1 844	4 539	17 229	12 328	4 901
December	5 911	4 986	1 852	4 545	17 294	12 343	4 951
1990							
January	5 951	4 981	1 850	4 570	17 352	12 367	4 985
February	5 958	4 963	1 848	4 576	17 345	12 378	4 967
March	5 915	4 951	1 856	4 582	17 304	12 353	4 951
April	5 906	4 954	1 851	4 577	17 288	12 345	4 943
May	5 909	4 954	1 854	4 577	17 294	12 376	4 918
June	5 922	4 952	1 862	4 577	17 313	12 372	4 941

MANSHIFTS LOST

Due mainly to a reduction in industrial stoppages, time lost by employees in the NSW coal industry in 1989-90 was significantly below the level of the previous two years. Time lost for the year amounted to 412 200 manshifts or 23.9 shifts per employee. This compares with 543 700 manshifts (32.4 per employee) lost in 1988-89 and 666 800 manshifts (37.5 per employee) lost in 1987-88.

Compared with the previous year, time lost due to industrial disputes in 1989-90 fell by 50% to 103 700 manshifts or 6.0 shifts per employee.

MANSHIFTS LOST PER EMPLOYEE

	1988-89	1989-90
Workers' compensation	7.1	5.3
Sick leave	10.5	10.8
Other absences	2.2	1.7
Industrial disputes	12.5	6.0
Other stoppages	0.1	0.1
Total	**32.4**	**23.9**

Time lost due to individual absenteeism (i.e. sick leave, workers' compensation, etc) for the year amounted to 306 900 manshifts or 17.8 shifts per employee. This compares with 332 300 manshifts or 19.8 shifts per employee in 1988-89. The decline in individual absenteeism was due to a continuing fall in the incidence of accidents in the industry and time lost by employees on workers' compensation. In percentage terms, industrial disputes accounted for 25.2% of time lost in 1989-90. Workers' compensation accounted for 22.3% and sick leave 45.2%.

Manshifts Lost, 1989-90

NSW Coal Mines

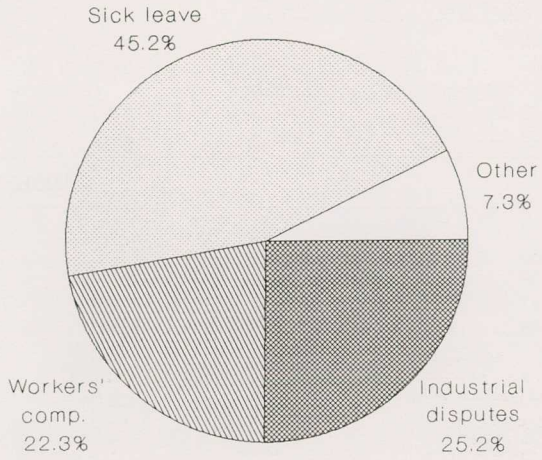


Table 62 – MANSHIFTS LOST, NSW COAL MINES

Year	'000 Manshifts Lost					Total lost	Manshifts lost per employee
	Industrial disputes	Other stoppages	Workers' compensation	Sick leave	Other absences		
UNDERGROUND MINES							
1983-84	61.4	0.7	141.0	152.1	32.2	387.4	24.6
1984-85	89.4	1.2	144.9	143.9	31.6	411.0	27.3
1985-86	197.2	0.5	141.3	140.5	31.1	510.6	33.5
1986-87	105.5	0.9	133.5	159.6	29.7	429.2	27.7
1987-88	228.0	1.0	125.9	136.3	24.0	515.2	37.7
1988-89	145.9	0.9	103.4	135.8	27.9	413.9	33.1
1989-90	62.7	1.3	77.6	142.6	21.2	305.4	24.7
OPEN CUTS							
1983-84	17.5	0.5	9.8	23.5	8.3	59.6	18.2
1984-85	28.5	0.4	13.0	26.5	8.8	77.2	21.2
1985-86	61.2	0.1	17.0	30.3	8.5	117.1	28.4
1986-87	28.0	0.1	16.4	37.2	7.8	89.5	20.2
1987-88	92.6	0.1	17.0	35.8	6.1	151.6	36.8
1988-89	64.4	0.2	16.1	40.8	8.3	129.8	30.3
1989-90	41.0	0.3	14.3	43.6	7.6	106.8	21.9
ALL MINES							
1983-84	78.8	1.4	150.7	175.6	40.5	447.0	23.5
1984-85	117.9	1.7	158.0	170.3	40.3	488.2	26.1
1985-86	258.4	0.8	158.3	170.7	39.5	627.7	32.4
1986-87	133.5	0.9	149.9	196.8	37.5	518.6	26.0
1987-88	320.7	0.9	143.0	172.1	30.1	666.8	37.5
1988-89	210.3	1.1	119.5	176.6	36.2	543.7	32.4
1989-90	103.7	1.6	91.9	186.2	28.8	412.2	23.9

Table 63 – INDUSTRIAL DISPUTES, NSW COAL MINES

Year	Singleton North West	Newcastle	West	South	Total	Underground Mines	Open Cuts
			'000 MANSHIFTS LOST				
1984	22.4	32.5	6.5	38.3	99.7	83.4	16.3
1985	37.8	29.9	14.1	22.3	104.1	73.8	30.4
1986	85.6	97.1	29.1	47.8	259.6	196.3	63.3
1987	102.0	94.2	18.0	50.5	264.8	191.4	73.3
1988	96.3	77.2	24.1	76.8	274.4	195.5	78.9
1989	46.6	35.9	8.7	29.0	120.2	78.3	41.9
1980-81	23.3	58.4	8.9	49.8	140.5	129.5	10.9
1981-82	66.6	108.2	24.7	123.3	322.8	283.9	38.9
1982-83	26.8	52.7	3.4	49.0	131.8	114.9	16.9
1983-84	25.8	25.7	5.5	21.8	78.8	61.4	17.5
1984-85	33.9	36.9	9.4	37.8	117.9	89.4	28.5
1985-86	84.9	95.6	26.2	51.8	258.4	197.2	61.2
1986-87	41.1	42.5	17.9	32.0	133.5	105.5	28.0
1987-88	120.5	111.7	24.5	63.9	320.7	228.0	92.6
1988-89	77.3	60.0	16.3	56.7	210.3	145.9	64.4
1989-90	46.7	23.3	6.4	27.3	103.7	62.7	41.0
			MANSHIFTS LOST PER EMPLOYEE				
1984	4.6	4.9	3.5	7.5	5.3	5.4	4.7
1985	7.1	4.6	7.2	4.3	5.5	4.9	7.8
1986	14.5	14.7	13.5	9.4	13.1	12.7	14.7
1987	17.3	14.8	9.2	10.2	13.8	12.9	17.1
1988	17.8	14.6	14.6	16.9	16.2	15.3	19.1
1989	8.2	7.2	4.9	6.3	7.1	6.3	9.1
1980-81	7.9	8.5	6.2	6.4	7.5	7.6	6.9
1981-82	17.7	15.0	13.9	15.6	15.6	15.4	17.3
1982-83	6.2	7.3	1.8	7.0	6.4	6.5	5.8
1983-84	5.5	3.8	2.9	3.8	4.1	3.9	5.3
1984-85	6.7	5.7	5.0	7.2	6.3	5.9	7.8
1985-86	15.1	14.5	12.7	10.1	13.3	12.9	14.8
1986-87	6.7	6.4	8.5	6.3	6.7	6.8	6.3
1987-88	22.0	19.1	13.9	13.7	18.0	16.7	22.5
1988-89	14.0	12.0	9.7	12.4	12.5	11.7	15.1
1989-90	8.0	4.7	3.5	6.0	6 0	5.1	8.4

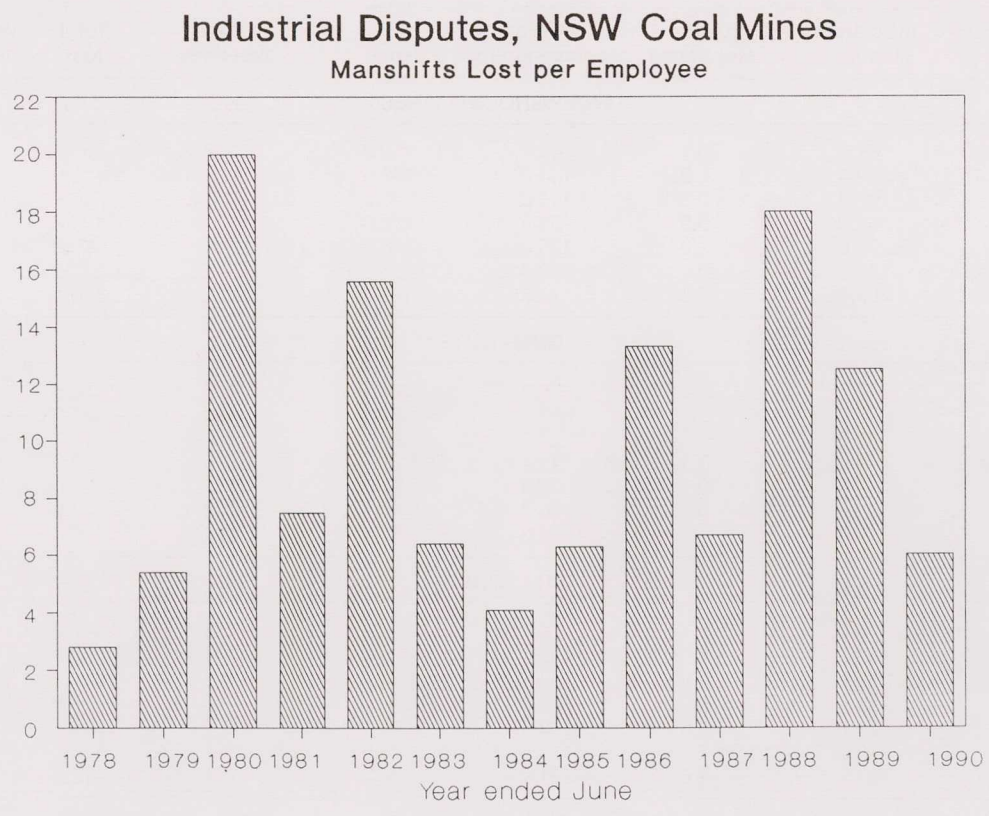


Table 64 – INDUSTRIAL DISPUTES BY CAUSE, NSW COAL MINES

Cause of Disputes	'000 Manshifts Lost				
	1985-86	1986-87	1987-88	1988-89	1989-90
Wage rates –	**207.0**	**12.0**	**11.8**	**10.6**	**11.5**
Over claim for increase	189.1	–	0.4	0.3	0.1
Over claim for decrease	–	–	–	–	–
Other	17.9	12.0	11.4	10.3	11.3
Combined wage/hours claim	–	–	–	–	0.1
Hours of work –	**0.3**	**8.1**	**75.1**	**134.1**	**7.8**
Over claim for reduction	–	–	–	–	–
Over claim for increase	–	–	–	–	–
Other	0.3	8.1	75.1	134.1	7.8
Leave, pensions, compensation and other provisions –	**2.4**	**34.6**	**0.6**	**2.5**	**0.8**
Holiday, long service, annual and sick leave	–	–	0.3	0.9	0.8
Pensions and retirement	1.6	34.4	–	–	–
Workers' compensation	0.8	–	0.2	0.3	–
Other	–	0.2	0.1	1.3	–
Matters of managerial control –	**17.2**	**15.3**	**22.7**	**13.2**	**25.8**
Computation of wages and allowances payable, hours worked, leave due, etc	3.2	0.9	3.2	1.4	1.2
Docking pay, fines, etc	1.8	0.7	1.3	2.1	0.9
All other disciplinary methods	1.5	1.3	1.5	2.0	4.7
Principles of promotion or filling positions (manning)	9.6	10.9	15.2	5.0	16.7
Personal disagreements, employment of particular person, etc	0.7	1.2	1.5	2.7	2.3
Disputes re production limits or quotas	0.4	0.3	–	–	–
Physical working conditions –	**4.4**	**6.4**	**6.1**	**8.8**	**10.4**
Alleged safety issues	3.0	3.9	4.1	5.1	8.0
Protective clothing or equipment	0.1	0.2	0.5	2.4	–
Uncomfortable working conditions	0.5	0.1	0.1	0.2	0.5
Supply and condition of amenities	0.7	0.2	0.1	0.2	0.4
Claim for assistance	–	–	–	0.0	–
Shortage, unequal or unfair distribution of equipment and material	–	1.4	0.5	0.2	0.8
Equipment out of order or in poor condition	0.1	0.2	0.3	0.2	0.4
Disputes about major re-organisation	–	0.1	–	0.3	–
Adoption of new methods and equipment	–	0.3	0.5	0.2	0.3
Trade unionism –	**9.0**	**12.6**	**7.8**	**29.7**	**28.4**
Against employment of non-unionists	0.1	0.3	–	–	–
Inter-union disputes	8.7	3.1	7.8	17.7	26.6
Intra-union disputes	0.2	0.2	–	0.1	0.2
Sympathy with another union in another industry	–	9.0	–	0.1	–
Disputes between employers and employees over union activities	–	–	–	11.8	1.6
Miscellaneous –	**18.1**	**44.5**	**196.6**	**11.4**	**19.1**
Protest directed against persons or situations other than employer or employee –					
(1) Local	–	1.1	0.5	1.9	4.2
(2) Non-local	13.6	40.6	–	–	11.7
"No Work" Whistle blown by management	–	–	–	–	–
Other – general greivances	0.1	0.1	–	0.4	–
Statutory or local holidays not covered by award	–	–	–	–	–
Funerals not arising from mine accidents	0.3	–	0.1	0.1	0.2
Following a fatal accident	1.3	2.3	0.2	0.5	0.1
Dismissals due to lack of trade, closures, etc	2.8	0.4	195.8	8.5	2.9
Total	**258.4**	**133.5**	**320.7**	**210.3**	**103.8**

Table 65 – INDUSTRIAL DISPUTES, MANSHIFTS LOST BY PERIODS, 1989-90
NSW COAL MINES
('000 Manshifts)

4 weeks ended	Singleton North West	Newcastle	West	South	Total	Underground mines	Open cuts
29 July 1989	9.0	4.7	1.2	7.0	21.9	14.0	7.9
26 August 1989	3.7	1.3	–	0.7	5.7	2.1	3.6
23 September 1989	3.1	1.1	0.1	0.5	4.8	2.0	2.8
21 October 1989	3.0	1.3	0.8	1.6	6.7	3.5	3.2
18 November 1989	1.3	4.6	1.1	0.4	7.4	6.1	1.3
16 December 1989	1.5	1.8	0.2	1.8	5.3	4.0	1.3
13 January 1990	0.4	0.2	–	0.4	1.0	0.7	0.3
10 February 1990	3.8	2.6	1.2	2.7	10.3	7.3	3.0
10 March 1990	6.9	2.7	0.4	0.8	10.8	5.5	5.3
7 April 1990	4.3	1.0	0.0	2.0	7.3	4.6	2.7
5 May 1990	1.7	0.2	0.1	0.2	2.2	0.8	1.4
2 June 1990	5.8	0.8	0.9	2.2	9.7	3.7	6.0
30 June 1990	2.2	0.8	0.4	7.1	10.5	8.3	2.2

LABOUR PRODUCTIVITY

Traditionally labour productivity in the NSW coal industry has been expressed in terms of output per manshift worked. Following the CIT restructuring decision of September 1988 and the implementation of a variety of rosters and shift lengths at coal mines, the Board changed its unit time collection from 7-hour shifts to hours. All mines now report on an hours basis.

Commencing with this yearbook, output per manshift has been replaced by output per employee hour as the basic labour productivity measure. Unless otherwise stated, hours and employee numbers used in labour productivity calculations cover all workers at a mine, including coal preparation plant operators, technical, administration and office staff.

Labour productivity in NSW coal mines is high by world standards in both underground and open cut mining. After a period of stagnation in the 1970's, productivity at NSW underground mines increased significantly in the 1980's, rising from 1.27 saleable tonnes per hour (1.48 tonnes raw) in 1980-81 to 2.11 saleable tonnes per hour (2.38 tonnes raw) in 1989-90. On a saleable coal basis this represents an increase of 66.1% over the period or an average annual growth rate of 5.8%. Productivity at underground mines in 1989-90, the first full year of operation under flexible working hours, rose by 7.1%.

LABOUR PRODUCTIVITY, 1989-90
(Saleable Tonnes)

	Employee hour	Employee year
Underground mines	**2.11**	**3 660**
Longwall	2.28	3 907
Non-longwall	1.95	3 410
Open Cuts	**4.01**	**6 750**
All mines	**2.64**	**4 530**

A number of factors have contributed to the increase in labour productivity at underground mines. Important among these have been technological change and increased capitalisation, particularly the expansion of high capacity longwall mining, general rationalisation and work practice changes and the closure of inefficient, high cost mines.

Underground mine labour productivity varies considerably from mine to mine. For example, in 1989-90 saleable output per hour ranged from 0.86 tonnes to 4.22 tonnes. There are many factors contributing to this variation, including depth of working and general mining conditions, age of the mine and underground haulage distances, technology employed in coal mining, loading and haulage and in materials handling generally, coal quality

Table 66 – SALEABLE COAL OUTPUT PER EMPLOYEE PER HOUR, NSW
(tonnes)

	Underground Mines						
Year	Singleton North West	Newcastle	West	South	Total	Open cuts	All Mines
1980-81	1.29	1.26	2.41	1.07	1.27	4.42	1.55
1981-82	1.30	1.24	2.51	1.15	1.33	3.35	1.56
1982-83	1.35	1.41	2.63	1.25	1.47	3.31	1.76
1983-84	1.36	1.46	2.41	1.45	1.56	3.42	1.90
1984-85	1.34	1.50	2.15	1.57	1.58	3.67	2.00
1985-86	1.36	1.54	2.38	1.69	1.67	3.78	2.12
1986-87	1.71	1.70	2.36	1.74	1.80	3.86	2.26
1987-88	1.61	1.66	2.90	1.77	1.84	4.07	2.34
1988-89	1.40	1.85	3.17	1.91	1.97	3.88	2.45
1989-90	1.63	2.00	2.93	2.09	2.11	4.01	2.64

Table 67 – RAW COAL OUTPUT PER EMPLOYEE PER HOUR, NSW
(tonnes)

	Underground mines				
Year	Coal face	Below ground	Overall	Open cuts	All mines
1980-81	4.91	2.13	1.48	5.38	1.82
1981-82	5.01	2.18	1.51	4.05	1.80
1982-83	5.30	2.42	1.66	4.10	2.04
1983-84	5.05	2.59	1.77	4.40	2.26
1984-85	5.16	2.67	1.81	4.75	2.41
1985-86	5.43	2.76	1.90	4.99	2.56
1986-87	5.83	2.95	2.05	5.07	2.73
1987-88	6.01	3.03	2.09	5.21	2.79
1988-89	6.31	3.14	2.20	5.07	2.92
1989-90	6.64	3.32	2.38	5.22	3.17

and marketable coal yields, the extent to which plant and equipment maintenance is carried out on site by mine employees, the extent of on-site administrative and technical services, employee incentive schemes and general management-employee relations.

On technology grounds, a basic distinction can be made between mines employing longwall mining techniques and those employing conventional bord and pillar methods with continuous miners and shuttle cars. Average labour productivity for the group of mines operating longwalls throughout 1989-90 was 2.28 saleable tonnes per hour (2.62 tonnes raw). Average productivity for conventional (non-longwall) mines was 1.95 saleable tonnes per hour (2.15 tonnes raw).

In open cut mining, labour productivity declined from the mid 1970's to the early 1980's. Since then however, it has shown an upward trend, reaching 4.07 saleable tonnes per hour in 1987-88 (5.21 tonnes raw). Industrial problems and wet weather adversely affected open cut operations in 1988-89 and productivity fell back to 3.88

Table 68 – RAW COAL OUTPUT PER EMPLOYEE PER HOUR, NSW UNDERGROUND MINES
(tonnes)

Year	Singleton North West	Newcastle	West	South	Total
1980-81	1.81	1.39	2.49	1.30	1.48
1981-82	1.80	1.35	2.59	1.36	1.51
1982-83	1.79	1.55	2.75	1.45	1.66
1983-84	1.79	1.66	2.53	1.66	1.77
1984-85	1.78	1.70	2.30	1.79	1.81
1985-86	1.77	1.73	2.55	1.90	1.90
1986-87	2.15	1.94	2.63	1.94	2.05
1987-88	1.99	1.87	3.09	2.02	2.09
1988-89	1.71	2.06	3.38	2.14	2.20
1989-90	1.99	2.26	3.18	2.36	2.38

saleable tonnes per hour (5.07 tonnes raw). In 1989-90, productivity recovered to 4.01 saleable tonnes (5.22 tonnes raw).

Like underground mines, labour productivity at open cuts varies considerably from mine to mine. In 1989-90, productivity at individual open cuts ranged from 2.73 to 6.0 saleable tonnes per hour.

For the industry as a whole, i.e. covering both underground and open cut mines, labour productivity has increased from 1.55 saleable tonnes per hour (1.82 tonnes raw) in 1980-81 to 2.64 saleable tonnes (3.17 tonnes raw) in 1989-90. This represents an increase of 70.3% over the period. The rise in industry productivity has resulted from both the improvement in underground mine productivity and the increasing proportion of production won by higher-productivity open cut mines.

Labour productivity as calculated by output per manshift or employee hour is a measure of labour efficiency 'on the job'. Another, perhaps more meaningful, measure is output per worker employed over a given period, eg a year. The latter takes into account the amount of time spent on the job and discounts for time lost through industrial stoppages and absenteeism.

The overall trend in output per employee year over the period 1980-81 to 1989-90 is similar to that for output per employee hour. At underground mines, saleable output per employee year has grown by 67.9% over the period, from 2 180 tonnes to 3 660 tonnes. At open cuts, output per employee year fell to 5 620 tonnes in 1981-82 but thereafter trended upward to 6 750 tonnes in 1989-90.

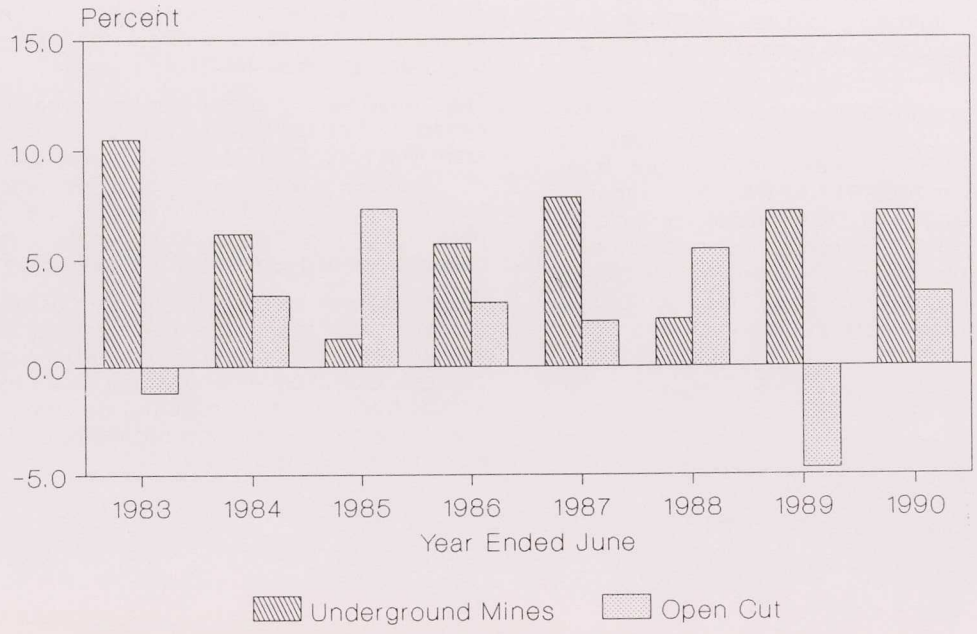
Whilst long-term trends in the two productivity measures are similar, year to year changes can be quite different – see adjacent graphs on annual labour productivity changes. Output per employee year shows much greater annual fluctuations than output per employee hour, reflecting in the main the sporadic industrial disruptions to which the industry is subjected.

Table 69 – OUTPUT PER EMPLOYEE PER YEAR, NSW COAL MINES
(tonnes)

	Raw Coal			Saleable Coal		
Year	Underground Mines	Open Cuts	All mines	Underground Mines	Open Cuts	All mines
1970-71	2 410	7 520	2 530	2 090	6 880	2 200
1971-72	2 330	10 420	2 580	1 980	9 870	2 230
1972-73	2 460	11 730	2 770	2 140	10 480	2 420
1973-74	2 320	13 410	2 720	2 020	11 630	2 360
1974-75	2 380	15 350	2 930	2 050	13 170	2 510
1975-76	2 230	11 770	2 680	1 880	10 100	2 270
1976-77	2 470	12 150	2 960	2 090	10 230	2 500
1977-78	2 510	11 990	3 070	2 120	10 110	2 590
1978-79	2 510	10 770	3 090	2 110	9 060	2 590
1979-80	2 230	9 790	2 830	1 890	8 170	2 390
1980-81	2 540	9 510	3 130	2 180	7 820	2 660
1981-82	2 420	6 810	2 900	2 120	5 620	2 500
1982-83	2 630	7 240	3 290	2 330	5 840	2 830
1983-84	2 710	7 290	3 490	2 370	5 670	2 940
1984-85	2 790	7 680	3 740	2 430	5 920	3 110
1985-86	2 950	7 820	3 990	2 600	5 930	3 310
1986-87	3 350	8 280	4 450	2 930	6 300	3 680
1987-88	3 250	7 760	4 290	2 860	6 050	3 600
1988-89	3 640	8 340	4 840	3 260	6 390	4 060
1989-90	4 130	8 800	5 450	3 660	6 750	4 530

Labour Productivity, Annual Changes

Saleable Output Per Employee Hour



Labour Productivity, Annual Changes

Saleable Output Per Employee Year

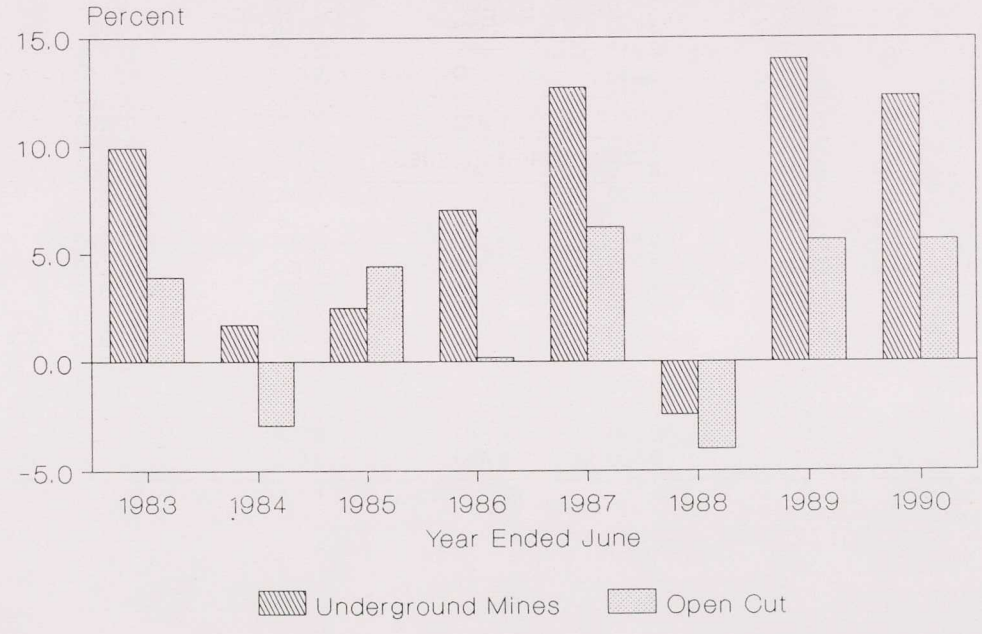


Table 70 – RAW COAL OUTPUT PER EMPLOYEE PER HOUR BY QUARTERS, NSW
(tonnes)

Quarters	Underground mines			Open cuts	All mines
	Coal face	Below ground	Overall		
1984-85					
Sept	5.20	2.71	1.83	4.87	2.45
Dec	5.32	2.78	1.88	4.98	2.51
March	4.83	2.49	1.69	4.54	2.25
June	5.30	2.72	1.85	4.58	2.42
1985-86					
Sept	5.57	2.90	1.98	5.24	2.69
Dec	5.47	2.79	1.92	5.07	2.60
March	4.90	2.41	1.66	4.92	2.35
June	5.76	2.94	2.01	4.68	2.58
1986-87					
Sept	5.67	2.94	2.04	4.98	2.70
Dec	5.60	2.82	1.96	5.12	2.67
March	5.57	2.77	1.94	5.03	2.63
June	6.57	3.32	2.31	5.18	2.94
1987-88					
Sept	5.87	2.99	2.05	4.97	2.65
Dec	6.23	3.17	2.19	5.55	2.95
March	5.72	2.86	1.98	5.16	2.70
June	6.31	3.12	2.15	5.20	2.88
1988-89					
Sept	6.64	3.37	2.32	5.71	3.17
Dec	6.18	3.03	2.10	5.15	2.84
March	6.05	3.02	2.15	5.14	2.93
June	6.32	3.10	2.21	4.22	2.72
1989-90					
Sept	7.05	3.57	2.56	5.25	3.28
Dec	6.34	3.20	2.30	5.87	3.31
March	6.63	3.30	2.38	4.88	3.09
June	6.44	3.14	2.26	4.95	3.01

Table 71 – HOURS WORKED, NSW COAL MINES

Year	Ordinary Hours		Overtime Hours		All Hours	
	Total	Per Employee	Total	Per Employee	Total	Per Employee
UNDERGROUND MINES						
1983-84	21 917 100	1 390.4	2 108 500	133.8	24 025 600	1 524.2
1984-85	20 593 500	1 366.0	2 618 100	173.7	23 211 600	1 539.9
1985-86	20 450 200	1 341.9	3 243 700	212.8	23 693 900	1 554.7
1986-87	21 476 300	1 387.3	3 774 100	243.8	25 250 400	1 631.1
1987-88	17 961 400	1 315.8	3 292 800	241.2	21 254 200	1 557.0
1988-89(a)	17 350 800	1 385.8	3 409 900	272.4	20 760 700	1 658.2
1989-90	17 513 400	1 417.8	3 895 100	315.3	21 408 500	1 733.1
OPEN CUT MINES						
1983-84	4 876 300	1 486.7	556 900	169.8	5 433 200	1 656.5
1984-85	5 286 500	1 450.3	603 900	165.7	5 890 400	1 616.0
1985-86	5 693 100	1 380.5	779 700	189.0	6 472 800	1 569.5
1986-87	6 383 800	1 441.4	841 200	189.9	7 225 000	1 631.3
1987-88	5 422 200	1 317.0	706 000	171.5	6 128 200	1 488.5
1988-89(a)	6 008 600	1 404.2	1 031 500	241.1	7 040 100	1 645.3
1989-90	6 847 400	1 406.3	1 354 000	278.1	8 201 400	1 684.4
ALL MINES						
1983-84	26 793 400	1 407.0	2 665 400	140.0	29 458 800	1 547.0
1984-85	25 880 000	1 382.6	3 222 000	172.2	29 102 000	1 554.8
1985-86	26 143 300	1 350.1	4 023 400	207.8	30 166 700	1 557.9
1986-87	27 860 100	1 399.3	4 615 300	231.8	32 475 400	1 631.1
1987-88	23 383 600	1 316.0	3 998 800	225.0	27 382 400	1 541.0
1988-89(a)	23 359 400	1 390.5	4 441 400	264.4	27 800 800	1 654.9
1989-90	24 360 800	1 414.7	5 249 100	304.8	29 609 900	1 719.5

(a) 53 week year

EXPORT COAL BRANDS

NOTE:

The product specifications given are typical of the main coal export brands currently marketed from NSW. However, most producers can supply products to other specifications where required. Further information can be obtained from the marketing contacts listed for each producer.

Abbreviations used in the specifications:

ad	air dry
ar	as received
daf	dry, ash-free
mmf	mineral matter-free

AUSTEN & BUTTA LTD

Address: 10th Floor
221 Miller Street
NORTH SYDNEY NSW 2060
(PO Box 1228 North Sydney 2059)

Telephone: (02) 968 0888
Telex: AA72430 (SYDCOAL)
Fax: (02) 968 0808

Marketing contacts: Mr I Dunlop, *Managing Director*

Typical Export Properties

	South Bulli Coking	South Bulli Low Ash Thermal	South Bulli Thermal	Invincible Thermal
Total moisture (% ar)	9.0	5.0	6.0	8.0
Proximate analysis (% ad)				
Moisture	1.0	1.0	1.0	1.6
Ash	9.5	13.0	15.0	13.3
Volatile matter	22.0	21.0	20.0	32.2
Fixed carbon	67.5	65.0	64.0	52.9
Total sulphur (% ad)	0.39	0.40	0.40	0.66
Specific energy (ad)				
Gross: MJ/kg	32.49	30.98	30.14	27.55
kcal/kg	7760	7400	7200	6580
Btu/lb	13970	13320	12960	11840
Net: MJ/kg		30.08	29.27	26.46
kcal/kg		7180	6990	6320
Btu/lb		12930	12580	11380
Ultimate analysis (% daf)				
Carbon	88.7	88.7	88.7	83.5
Hydrogen	4.61	4.61	4.61	5.60
Nitrogen	1.53	1.53	1.53	1.90
Sulphur	0.44	0.47	0.48	0.77
Oxygen (diff)	4.7	4.7	4.7	8.2
Chlorine (% ad)		0.05	0.05	0.01
Phosphorus (% ad)	0.037	0.037	0.050	0.014
Size (mm)	50x0	45x0	50x0	50x0
Hardgrove grindability		65	62	50
Coking properties				
Crucible swelling No.	6	1.5	1	1.5
Gray King coke type	G1			
Max. fluidity (ddpm)	1500			
Max. dilatation (%)	20			
Petrographic parameters				
Maceral analysis (% mmf)				
Vitrinite	46			
Semi-fusinite	35			
Other inertinite	15			
Liptinite				
R_v, max (%)	1.27			
Analysis of ash (%)				
SiO_2	54.2	54.2	54.2	68.1
Al_2O_3	36.2	36.2	36.2	26.0
Fe_2O_3	4.22	4.22	4.22	1.31
TiO_2	1.25	1.25	1.25	1.00
CaO	0.69	0.69	0.69	0.34
MgO	0.38	0.38	0.38	0.28
Na_2O	0.38	0.38	0.38	0.12
K_2O	1.49	1.49	1.49	2.71
P_2O_5	1.00	1.00	1.00	0.14
Mn_3O_4	0.04	0.04	0.04	0.03
SO_3	0.10	0.10	0.10	0.03
Ash fusion temperatures (°C)				
(reducing atmosphere)				
Deformation		1560	1560	1556
Sphere		>1600	>1600	>1560
Hemisphere		>1600	>1600	>1560
Flow		>1600	>1600	>1560

BAYSWATER COLLIERY CO PTY LTD

Address: 167-187 Kent Street
SYDNEY NSW 2000
(GPO Box 1517 Sydney 2001)

Telephone: (02) 250 5000
Telex: AA120244
Fax: (02) 250 5702

Marketing contacts: Mr D. Woods, *Manager Coal Marketing*

Typical Export Properties

	Low Ash PCI	Steam
Total moisture (% ar)	9.0	9.5
Proximate analysis (% ad)		
Moisture	3.0	2.5
Ash	8.5	13.5
Volatile matter	34.5	33.0
Fixed carbon	54.0	51.0
Total sulphur (% ad)	0.89	0.92
Specific energy (ad)		
Gross: MJ/kg	30.56	28.54
kcal/kg	7300	6820
Btu/lb	13140	12270
Net: MJ/kg	29.40	27.48
kcal/kg	7020	6560
Btu/lb	12640	11820
Ultimate analysis (% daf)		
Carbon	83.0	83.1
Hydrogen	5.61	5.36
Nitrogen	1.75	1.78
Sulphur	1.01	1.10
Oxygen (diff)	8.6	8.7
Chlorine (% ad)	0.03	0.03
Phosphorus (% ad)	0.050	0.068
Size (mm)	40x0	40x0
Hardgrove grindability	49	48
Coking properties		
Crucible swelling No.	1.5	1
Gray King coke type		
Max. fluidity (ddpm)		
Max. dilatation (%)		
Petrographic parameters		
Maceral analysis (% mmf)		
Vitrinite		
Semi-fusinite		
Other inertinite		
Liptinite		
R_v, max (%)		
Analysis of ash (%)		
SiO_2	50.8	49.5
Al_2O_3	29.0	29.5
Fe_2O_3	5.50	5.30
TiO_2	1.70	2.00
CaO	7.50	7.00
MgO	0.60	0.50
Na_2O	0.30	0.34
K_2O	0.30	0.25
P_2O_5	1.10	1.90
Mn_3O_4	0.04	0.04
SO_3	3.10	3.30
Ash fusion temperatures (°C)		
(reducing atmosphere)		
Deformation	1300	1300
Sphere	1350	1400
Hemisphere	1390	1430
Flow	1410	1470

BCSC COLLIERIES PTY LTD

Address: Portland House
1 McLaren Street
NORTH SYDNEY NSW 2060
(GPO Box 1571 Sydney 2001)

Telephone: (02) 925 9888
Telex: AA22466
Fax: (02) 929 4520

Marketing contacts: Mr T. Bertinshaw, *Manager Coal Marketing*

Typical Export Properties

	Lithgow Semi-Soft Coking	PCI Low Ash	Lithgow Steam
Total moisture (% ar)	8.0	8.0	8.0
Proximate analysis (% ad)			
Moisture	2.5	2.5	2.5
Ash	9.5	12.5	14.0
Volatile matter	31.0	31.5	31.5
Fixed carbon	57.0	53.5	52.0
Total sulphur (% ad)	0.60	0.59	0.58
Specific energy (ad)			
Gross: MJ/kg	30.14	29.31	28.47
kcal/kg	7200	7000	6800
Btu/lb	12960	12600	12240
Net: MJ/kg	29.08	28.25	27.43
kcal/kg	6940	6750	6550
Btu/lb	12500	12150	11790
Ultimate analysis (% daf)			
Carbon	83.6	84.0	84.0
Hydrogen	5.19	5.30	5.30
Nitrogen	1.80	1.80	1.80
Sulphur	0.68	0.70	0.70
Oxygen (diff)	8.7	8.2	8.2
Chlorine (% ad)	0.01	0.02	0.02
Phosphorus (% ad)	0.014	0.007	0.007
Size (mm)	40x0	40x0	40x0
Hardgrove grindability	45	45	45
Coking properties			
Crucible swelling No.	1	1	1
Gray King coke type			
Max. fluidity (ddpm)			
Max. dilatation (%)			
Petrographic parameters			
Maceral analysis (% mmf)			
Vitrinite			
Semi-fusinite			
Other inertinite			
Liptinite			
R_v, max (%)			
Analysis of ash (%)			
SiO_2	65.0	65.0	65.0
Al_2O_3	29.0	29.0	29.0
Fe_2O_3	1.30	1.30	1.30
TiO_2	1.00	1.00	1.00
CaO	0.30	0.30	0.30
MgO	0.40	0.40	0.40
Na_2O	0.06	0.06	0.06
K_2O	2.50	2.50	2.50
P_2O_5	0.10	0.15	0.15
Mn_3O_4	0.02	0.02	0.02
SO_3	0.10	0.10	0.10
Ash fusion temperatures (°C)			
(reducing atmosphere)			
Deformation	1500	1500	1500
Sphere	>1560	>1560	>1560
Hemisphere	>1560	>1560	>1560
Flow	>1560	>1560	>1560

BHP COY LTD

Address: Collieries Division
BHP Steel International Group
Level 4, 90 Crown Street
WOLLONGONG NSW 2500
(PO Box 431 Wollongong East 2520)
Marketing contacts: Mr E J Bagnall, *Marketing Manager*

Telephone: (042) 24 2300
Telex: AA28560
Fax: (042) 26 2248

Typical Export Properties

	Illawarra Coking	Illawarra Energy(1)	Illawarra Energy(2)
Total moisture (% ar)	9.0	6.0	6.0
Proximate analysis (% ad)			
Moisture	1.0	1.0	1.0
Ash	9.5	17.0	21.0
Volatile matter	22.5	21.0	21.0
Fixed carbon	67.0	61.0	57.0
Total sulphur (% ad)	0.40	0.41	0.40
Specific energy (ad)			
Gross: MJ/kg	32.45	29.31	27.84
kcal/kg	7750	7000	6650
Btu/lb	13950	12600	11970
Net: MJ/kg		28.38	26.87
kcal/kg		6780	6420
Btu/lb		12200	11550
Ultimate analysis (% daf)			
Carbon	89.0	88.5	87.5
Hydrogen	5.20	5.00	5.50
Nitrogen	1.70	1.50	1.50
Sulphur	0.50	0.50	0.50
Oxygen (diff)	3.6	4.5	5.0
Chlorine (% ad)		0.01	0.01
Phosphorus (% ad)	0.040	0.050	0.020
Size (mm)	50x0	50x0	50x0
Hardgrove grindability		75	70
Coking properties			
Crucible swelling No.	7	2	3
Gray King coke type	G5		
Max. fluidity (ddpm)	2000		
Max. dilatation (%)	+100		
Petrographic parameters			
Maceral analysis (% mmf)			
Vitrinite	55		
Semi-fusinite	29		
Other inertinite	16		
Liptinite			
R_V, max (%)	1.25		
Analysis of ash (%)			
S_iO_2	58.0	63.0	67.0
Al_2O_3	28.0	25.0	24.0
Fe_2O_3	3.50	5.00	5.00
TiO_2	1.40	1.00	1.00
CaO	2.00	2.00	0.60
MgO	0.50	0.50	0.50
Na_2O	0.30	0.30	0.15
K_2O	1.50	1.00	1.10
P_2O_5	1.00	1.00	0.15
Mn_3O_4	0.05	0.10	0.15
SO_3	0.30	0.50	1.05
Ash fusion temperatures (°C)			
(reducing atmosphere)			
Deformation		1400	1420
Sphere		1540	1540
Hemisphere		1560	1560
Flow		>1560	>1560

BLOOMFIELD COLLIERIES PTY LTD

Address: 4 Mile Creek Road
EAST MAITLAND NSW 2323
(PO Box 4)

Telephone: (049) 33 7077
Telex:
Fax: (049) 33 8940

Marketing contacts: Mr G Bellamy, *Commercial Manager*

Typical Export Properties

	Rathluba Coking	Donaldson Coking	Steam 6700	Steam 6400	Steam 6300
Total moisture (% ar)	7.0	8.0	8.0	8.0	8.0
Proximate analysis (% ad)					
Moisture	2.5	2.5	2.5	2.5	2.5
Ash	8.0	9.5	15.0	18.5	19.0
Volatile matter	36.0	37.0	33.0	32.0	31.0
Fixed carbon	53.5	51.0	49.5	47.0	47.5
Total sulphur (% ad)	0.72	1.23	1.25	1.50	1.26
Specific energy (ad)					
Gross: MJ/kg	31.15	30.17	28.05	26.80	26.38
kcal/kg	7440	7210	6700	6400	6300
Btu/lb	13390	12970	12060	11520	11340
Net: MJ/kg			26.99	25.76	25.36
kcal/kg			6450	6150	6060
Btu/lb			11600	11080	10900
Ultimate analysis (% daf)					
Carbon	82.7	83.0	83.2	82.0	81.8
Hydrogen	5.64	5.60	5.51	5.57	5.53
Nitrogen	2.00	2.00	2.12	1.95	1.95
Sulphur	0.80	1.40	1.52	1.90	1.60
Oxygen (diff)	8.9	8.0	7.7	8.6	9.2
Chlorine (% ad)			0.04	0.04	0.07
Phosphorus (% ad)	0.007	0.007	0.012	0.009	0.009
Size (mm)	50x0	50x0	50x0	50x0	50x0
Hardgrove grindability			48	48	48
Coking properties					
Crucible swelling No.	5.5	5	1.5	1	1
Gray King coke type	G2	G2			
Max. fluidity (ddpm)	400	800			
Max. dilatation (%)	+23	+36			
Petrographic parameters					
Maceral analysis (% mmf)					
Vitrinite	75	81			
Semi-fusinite	8	7			
Other inertinite	5	7			
Liptinite	5	5			
R_v, max (%)	0.81	0.78			
Analysis of ash (%)					
SiO_2	56.9	61.6	69.0	66.3	67.4
Al_2O_3	28.3	28.6	22.0	24.1	24.5
Fe_2O_3	3.81	3.98	0.33	5.31	3.38
TiO_2	1.50	1.03	1.19	1.07	1.23
CaO	2.90	1.60	0.67	0.27	0.27
MgO	0.33	0.51	0.54	0.49	0.46
Na_2O	1.15	0.67	0.19	0.20	0.21
K_2O	0.96	0.92	1.01	1.16	1.17
P_2O_5	0.84	0.36	0.20	0.10	0.11
Mn_3O_4	0.01	0.01	0.01	0.01	0.02
SO_3	1.35	0.42	0.45	0.18	0.13
Ash fusion temperatures (°C)					
(reducing atmosphere)					
Deformation			1450	1450	1530
Sphere			1480	1480	
Hemisphere			>1560	>1560	>1560
Flow			>1560	>1560	>1560

CAMBERWELL COAL PTY LTD

Address: Bridgeman Road
SINGLETON NSW 2330
(PMB No. 7)

Telephone: (065) 77 4111
Telex:
Fax: (065) 71 1188

Marketing contacts: Mr R. Gazzard, *General Manager*

Typical Export Properties

	Soft Coking	Semi-Soft Coking	Thermal
Total moisture (% ar)	9.0	9.0	9.0
Proximate analysis (% ad)			
Moisture	2.9	2.9	2.9
Ash	6.5	9.0	14.4
Volatile matter	37.3	36.2	33.7
Fixed carbon	53.3	51.9	49.0
Total sulphur (% ad)	0.57	0.55	0.57
Specific energy (ad)			
Gross: MJ/kg	30.94	30.10	28.06
kcal/kg	7390	7190	6700
Btu/lb	13300	12940	12060
Net: MJ/kg			26.93
kcal/kg			6430
Btu/lb			11580
Ultimate analysis (% daf)			
Carbon	82.5	82.5	82.5
Hydrogen	5.80	5.80	5.80
Nitrogen	1.90	1.90	1.90
Sulphur	0.63	0.62	0.69
Oxygen (diff)	9.2	9.2	9.1
Chlorine (% ad)			0.01
Phosphorus (% ad)	0.029	0.029	0.029
Size (mm)	50x0	50x0	50x0
Hardgrove grindability			48
Coking properties			
Crucible swelling No.	5	4	2.5
Gray King coke type			
Max. fluidity (ddpm)	200	75	
Max. dilatation (%)	+25	+5	
Petrographic parameters			
Maceral analysis (% mmf)			
Vitrinite	82	82	
Semi-fusinite			
Other inertinite	12	12	
Liptinite	6	6	
R_v, max (%)	0.79	0.79	
Analysis of ash (%)			
SiO_2	55.1	55.1	55.1
Al_2O_3	25.7	25.7	25.7
Fe_2O_3	5.33	5.33	5.33
TiO_2	1.44	1.41	1.41
CaO	4.61	4.61	4.61
MgO	1.61	1.61	1.61
Na_2O	0.54	0.54	0.54
K_2O	1.33	1.33	1.33
P_2O_5	0.46	0.46	0.46
Mn_3O_4	0.04	0.04	0.04
SO_3	3.12	3.12	3.12
Ash fusion temperatures (°C)			
(reducing atmosphere)			
Deformation			1320
Sphere			1460
Hemisphere			1480
Flow			1530

CLUTHA LTD

Address: Level 18
1 York Street
SYDNEY NSW 2000

Telephone: (02) 251 2866
Telex: AA177586 (CLUSYD)
Fax: (02) 251 2821

Marketing contacts: Mr W Tweddle, *General Manager Marketing*

Typical Export Properties

	Wollondilly Coking	Brimstone Coking	Burragorang Valley Coking Blend	Burragorang Thermal
Total moisture (% ar)	8.0	8.0	9.0	8.0
Proximate analysis (% ad)				
Moisture	1.5	1.5	1.5	1.5
Ash	7.9	8.2	9.8	16.0
Volatile matter	27.0	27.5	27.0	26.0
Fixed carbon	63.6	62.8	61.7	56.5
Total sulphur (% ad)	0.38	0.38	0.38	0.35
Specific energy (ad)				
Gross: MJ/kg	31.80	31.74	31.08	28.69
kcal/kg	7600	7580	7420	6850
Btu/lb	13670	13640	13360	12330
Net: MJ/kg				27.81
kcal/kg				6640
Btu/lb				11960
Ultimate analysis (% daf)				
Carbon	86.3	86.3	86.4	85.3
Hydrogen	4.82	4.82	4.85	4.62
Nitrogen	1.54	1.54	1.75	1.69
Sulphur	0.42	0.42	0.43	0.42
Oxygen (diff)	6.9	6.9	6.6	8.0
Chlorine (% ad)	0.01	0.01	0.01	0.03
Phosphorus (% ad)	0.059	0.039	0.059	0.059
Size (mm)	50x0	50x0	50x0	50x0
Hardgrove grindability				56
Coking properties				
Crucible swelling No.	5	6	4	2
Gray King coke type	G1	G2	G	
Max. fluidity (ddpm)	800	1500	200	
Max. dilatation (%)	+17	+26	−1	
Petrographic parameters				
Maceral analysis (% mmf)				
Vitrinite	50	50	42	
Semi-fusinite	30	30	21	
Other inertinite	18	18	35	
Liptinite	2	2	2	
R_v, max (%)	1.01	1.01	1.01	
Analysis of ash (%)				
SiO_2	57.8	57.8	62.6	59.3
Al_2O_3	33.2	33.2	27.7	32.1
Fe_2O_3	2.34	2.34	3.04	3.66
TiO_2	1.47	1.47	1.24	1.21
CaO	1.34	1.34	0.76	0.60
MgO	0.29	0.29	0.34	0.66
Na_2O	0.17	0.17	0.08	0.21
K_2O	0.87	0.87	0.99	1.37
P_2O_5	1.58	1.58	1.37	0.97
Mn_3O_4	0.03	0.03	0.06	0.15
SO_3	0.35	0.35	0.33	0.08
Ash fusion temperatures (°C)				
(reducing atmosphere)				
Deformation				1420
Sphere				>1600
Hemisphere				>1600
Flow				>1600

CLUTHA LTD (continued)

Typical Export Properties

	Glenlee Thermal	Oakdale Thermal	Wollondilly Thermal
Total moisture (% ar)	8.0	8.0	8.0
Proximate analysis (% ad)			
Moisture	1.5	1.5	1.5
Ash	18.0	15.5	12.5
Volatile matter	23.5	25.5	26.4
Fixed carbon	57.0	57.5	59.6
Total sulphur (% ad)	0.36	0.33	0.35
Specific energy (ad)			
Gross: MJ/kg	27.44	28.84	29.85
kcal/kg	6550	6890	7130
Btu/lb	11880	12400	12830
Net: MJ/kg	26.52	27.90	28.90
kcal/kg	6330	6660	6900
Btu/lb	11400	12000	12420
Ultimate analysis (% daf)			
Carbon	85.0	85.5	86.0
Hydrogen	5.00	4.90	4.80
Nitrogen	1.80	1.57	1.66
Sulphur	0.45	0.40	0.41
Oxygen (diff)	7.8	7.6	7.1
Chlorine (% ad)	0.06	0.02	0.03
Phosphorus (% ad)	0.059	0.059	0.059
Size (mm)	50x0	50x0	
Hardgrove grindability	55	58	56
Coking properties			
Crucible swelling No.	1	3.5	3
Gray King coke type			
Max. fluidity (ddpm)			
Max. dilatation (%)			
Petrographic parameters			
Maceral analysis (% mmf)			
Vitrinite			
Semi-fusinite			
Other inertinite			
Liptinite			
R_v, max (%)			
Analysis of ash (%)			
SiO_2	49.5	59.5	63.7
Al_2O_3	37.1	31.2	29.9
Fe_2O_3	4.10	4.02	2.55
TiO_2	0.82	1.28	1.06
CaO	1.75	1.15	0.40
MgO	0.79	0.52	0.37
Na_2O	0.53	0.01	0.08
K_2O	0.95	1.12	0.97
P_2O_5	1.37	0.90	0.65
Mn_3O_4	0.12	0.11	0.05
SO_3	1.00	0.16	0.16
Ash fusion temperatures (°C)			
(reducing atmosphere)			
Deformation	1380	1450	1600
Sphere	>1600	>1600	>1600
Hemisphere	>1600	>1600	>1600
Flow	>1600	>1600	>1600

COAL & ALLIED INDUSTRIES LTD

Address: Royal Insurance House
1 York Street
SYDNEY NSW 2000
(GPO Box 1554 Sydney 2001)

Telephone: (02) 233 4122
Telex: AA21226 (COALALL)
Fax: (02) 251 3395

Marketing contacts: Mr I MacPhee, *General Manager Marketing*

Typical Export Properties

	Mt Thorley Coking	Hunter Valley Coking	Hunter Valley Semi-Soft Coking	Mt Thorley Semi-Soft Coking
Total moisture (% ar)	9.0	9.0	9.0	9.0
Proximate analysis (% ad)				
Moisture	2.5	3.0	3.5	2.5
Ash	8.5	7.0	9.5	9.5
Volatile matter	34.0	35.0	32.0	33.5
Fixed carbon	55.0	55.0	55.0	54.5
Total sulphur (% ad)	0.45	0.45	0.35	0.46
Specific energy (ad)				
Gross: MJ/kg	30.44	30.98	29.31	29.94
kcal/kg	7270	7400	7000	7150
Btu/lb	13090	13320	12600	12870
Net: MJ/kg				
kcal/kg				
Btu/lb				
Ultimate analysis (% daf)				
Carbon	82.3	84.0	83.1	82.2
Hydrogen	5.54	5.30	5.20	5.42
Nitrogen	1.80	1.70	1.70	1.78
Sulphur	0.51	0.50	0.40	0.52
Oxygen (diff)	9.9	8.5	9.6	10.1
Chlorine (% ad)				
Phosphorus (% ad)	0.006	0.010	0.014	0.010
Size (mm)	40x0	50x0	50x0	40x0
Hardgrove grindability			55	52
Coking properties				
Crucible swelling No.	5	5	3	3
Gray King coke type	G1	G	E	F
Max. fluidity (ddpm)	100	100	24	43
Max. dilatation (%)		−10		
Petrographic parameters				
Maceral analysis (% mmf)				
Vitrinite	75	70	60	
Semi-fusinite	18	22	18	
Other inertinite	2	4	17	
Liptinite	2	2	5	
R_v, max (%)	0.78	0.71	0.77	
Analysis of ash (%)				
SiO_2	69.9	68.5	66.8	70.2
Al_2O_3	23.9	24.0	26.0	23.5
Fe_2O_3	2.76	2.80	2.70	3.00
TiO_2	1.15	1.10	1.10	1.10
CaO	0.29	0.70	0.70	0.29
MgO	0.38	0.60	0.60	0.38
Na_2O	0.50	0.50	0.50	0.60
K_2O	0.59	1.10	1.10	0.59
P_2O_5	0.22	0.30	0.30	0.21
Mn_3O_4	0.01	0.10	0.10	0.01
SO_3	0.00	0.30	0.30	0.10
Ash fusion temperatures (°C)				
(reducing atmosphere)				
Deformation			1500	1450
Sphere			1540	1550
Hemisphere			>1560	>1560
Flow	>1500	>1560	>1560	>1560

Typical Export Properties

	Hunter Valley Steam	Wallarah Steam	Mt Thorley Steam	Chain Valley Steam	C&A Blend Steam
Total moisture (% ar)	9.0	9.0	9.0	9.0	9.0
Proximate analysis (% ad)					
Moisture	2.5	3.5	2.5	2.5	2.5
Ash	13.5	13.5	15.5	17.0	20.0
Volatile matter	34.0	30.0	31.5	30.0	30.0
Fixed carbon	50.0	53.0	50.5	50.5	47.5
Total sulphur (% ad)	0.50	0.28	0.40	0.34	1.00
Specific energy (ad)					
Gross: MJ/kg	28.47	28.26	27.84	27.00	26.38
kcal/kg	6800	6750	6650	6450	6300
Btu/lb	12240	12150	11970	11610	11340
Net: MJ/kg	27.46	27.24	26.83	25.97	25.41
kcal/kg	6560	6510	6410	6200	6070
Btu/lb	11810	11710	11540	11160	10920
Ultimate analysis (% daf)					
Carbon	82.2	83.4	81.6	83.0	81.6
Hydrogen	5.10	5.10	5.26	5.50	5.30
Nitrogen	1.80	1.60	1.65	1.60	1.70
Sulphur	0.60	0.34	0.49	0.42	1.29
Oxygen (diff)	10.3	9.6	10.9	9.5	10.1
Chlorine (% ad)	0.05	0.04	0.03	0.04	0.03
Phosphorus (% ad)	0.020	0.010	0.010	0.010	0.068
Size (mm)	50x0	50x0	40x0	40x0	50x0
Hardgrove grindability	50	50	50	50	50
Coking properties					
Crucible swelling No.	2	2	2	2	2
Gray King coke type					
Max. fluidity (ddpm)					
Max. dilatation (%)					
Petrographic parameters					
Maceral analysis (% mmf)					
Vitrinite					
Semi-fusinite					
Other inertinite					
Liptinite					
R_v, max (%)					
Analysis of ash (%)					
SiO_2	68.6	61.0	71.6	61.0	72.4
Al_2O_3	24.0	27.0	21.4	27.0	18.9
Fe_2O_3	2.70	6.00	4.45	6.00	3.95
TiO_2	1.10	1.30	0.88	1.30	0.79
CaO	0.70	1.50	0.12	1.50	0.72
MgO	0.60	1.00	0.40	1.00	0.51
Na_2O	0.50	0.50	0.26	0.50	0.40
K_2O	1.10	0.50	0.62	0.50	1.42
P_2O_5	0.30	0.10	0.15	0.10	0.46
Mn_3O_4	0.10	0.10	0.02	0.10	0.03
SO_3	0.30	1.00	0.10	1.00	0.42
Ash fusion temperatures (°C)					
(reducing atmosphere)					
Deformation	1500	1450	1450	1450	1450
Sphere	1540	1500	1550	1550	1550
Hemisphere	>1560	1560	>1560	>1560	>1560
Flow	>1560	>1560	>1560	>1560	>1560

COALEX PTY LTD

Address: Level 9
100 Christie Street
ST LEONARDS NSW 2065
(PO Box 309)

Telephone: (02) 436 0555
Telex: AA26288 (COALX)
Fax: (02) 438 4630

Marketing contacts: Mr R. Knight, *General Manager Marketing*

Typical Export Properties

	Lithgow Steam	Katoomba Steam
Total moisture (% ar)	8.0	8.0
Proximate analysis (% ad)		
Moisture	2.5	2.2
Ash	14.8	13.3
Volatile matter	30.5	27.0
Fixed carbon	52.2	57.5
Total sulphur (% ad)	0.59	0.35
Specific energy (ad)		
Gross: MJ/kg	28.47	28.89
kcal/kg	6800	6900
Btu/lb	12240	12420
Net: MJ/kg	27.48	27.90
kcal/kg	6560	6660
Btu/lb	11810	12000
Ultimate analysis (% daf)		
Carbon	83.6	84.3
Hydrogen	5.10	5.00
Nitrogen	1.80	1.70
Sulphur	0.70	0.41
Oxygen (diff)	8.8	8.6
Chlorine (% ad)	0.03	0.01
Phosphorus (% ad)	0.010	0.029
Size (mm)	38x0	38x0
Hardgrove grindability	47	49
Coking properties		
Crucible swelling No.	1	1
Gray King coke type		
Max. fluidity (ddpm)		
Max. dilatation (%)		
Petrographic parameters		
Maceral analysis (% mmf)		
Vitrinite		
Semi-fusinite		
Other inertinite		
Liptinite		
R_v, max (%)		
Analysis of ash (%)		
SiO_2	69.2	67.8
Al_2O_3	24.4	27.6
Fe_2O_3	1.10	1.70
TiO_2	1.30	0.80
CaO	0.60	0.10
MgO	0.40	0.10
Na_2O	0.07	0.03
K_2O	2.15	0.40
P_2O_5	0.20	0.50
Mn_3O_4	0.02	0.01
SO_3	0.09	0.10
Ash fusion temperatures (°C)		
(reducing atmosphere)		
Deformation	1400	1440
Sphere	>1550	>1550
Hemisphere	>1550	>1550
Flow	>1550	>1550

DRAYTON COAL PTY LTD

Address: 221 Miller Street
NORTH SYDNEY NSW 2060
(PO Box 1228 North Sydney 2059)

Telephone: (02) 968 0822
Telex: AA72430 (DRACOL)
Fax: (02) 968 0809

Marketing contacts: Mr R. Hurley, *General Manager Marketing*

Typical Export Properties

		Premium Steam
Total moisture (% ar)		9.5
Proximate analysis (% ad)		
Moisture		2.5
Ash		14.0
Volatile matter		34.0
Fixed carbon		49.5
Total sulphur (% ad)		0.95
Specific energy (ad)		
Gross:	MJ/kg	28.26
	kcal/kg	6750
	Btu/lb	12150
Net:	MJ/kg	27.21
	kcal/kg	6500
	Btu/lb	11700
Ultimate analysis (% daf)		
Carbon		82.7
Hydrogen		5.40
Nitrogen		1.80
Sulphur		1.14
Oxygen (diff)		9.0
Chlorine (% ad)		0.03
Phosphorus (% ad)		0.058
Size (mm)		50x0
Hardgrove grindability		48
Coking properties		
Crucible swelling No.		1.5
Gray King coke type		
Max. fluidity (ddpm)		
Max. dilatation (%)		
Petrographic parameters		
Maceral analysis (% mmf)		
Vitrinite		
Semi-fusinite		
Other inertinite		
Liptinite		
R_v, max (%)		
Analysis of ash (%)		
SiO_2		54.5
Al_2O_3		27.5
Fe_2O_3		7.50
TiO_2		1.90
CaO		4.50
MgO		0.60
Na_2O		0.15
K_2O		0.35
P_2O_5		1.20
Mn_3O_4		0.06
SO_3		1.80
Ash fusion temperatures (°C)		
(reducing atmosphere)		
Deformation		1350
Sphere		1400
Hemisphere		1450
Flow		1500

FAI MINING LTD

Address: Cnr Market & Scott Streets
NEWCASTLE NSW 2300
(PO Box 841)

Telephone: (049) 29 6477
Telex: AA28949
Fax: (049) 29 6025

Marketing contacts: Mr R Hose, *Marketing Manager*

Typical Export Properties

	Macquarie Coking	Macquarie Energy	Great Greta Steam
Total moisture (% ar)	9.0	9.0	7.0
Proximate analysis (% ad)			
Moisture	2.3	2.3	2.5
Ash	7.5	16.5	15.0
Volatile matter	35.0	30.5	43.0
Fixed carbon	55.2	50.7	41.0
Total sulphur (% ad)	0.50	0.45	0.39
Specific energy (ad)			
Gross: MJ/kg	31.35	28.05	28.47
kcal/kg	7490	6700	6800
Btu/lb	13480	12060	12240
Net: MJ/kg		27.01	27.27
kcal/kg		6450	6510
Btu/lb		11610	11720
Ultimate analysis (% daf)			
Carbon	84.7	84.5	81.4
Hydrogen	5.50	5.50	6.34
Nitrogen	2.10	2.00	1.18
Sulphur	0.55	0.56	6.42
Oxygen (diff)	7.2	7.4	4.7
Chlorine (% ad)		0.03	0.01
Phosphorus (% ad)	0.049	0.060	0.050
Size (mm)	40x0	50x0	50x0
Hardgrove grindability		50	41
Coking properties			
Crucible swelling No.	7	2	4
Gray King coke type	G6		
Max. fluidity (ddpm)	1500		
Max. dilatation (%)	+90		
Petrographic parameters			
Maceral analysis (% mmf)			
Vitrinite	82		
Semi-fusinite	4		
Other inertinite	8		
Liptinite	6		
R_v, max (%)	0.92		
Analysis of ash (%)			
SiO_2	65.0	65.0	26.1
Al_2O_3	22.0	25.0	23.6
Fe_2O_3	4.20	2.50	7.63
TiO_2	1.00	1.00	1.12
CaO	2.50	3.00	18.95
MgO	1.00	0.80	5.02
Na_2O	0.70	0.70	0.75
K_2O	1.00	0.90	0.16
P_2O_5	1.20	1.50	0.58
Mn_3O_4	0.05	0.02	0.19
SO_3	0.20	0.15	14.97
Ash fusion temperatures (°C)			
(reducing atmosphere)			
Deformation		1300	1250
Sphere		1400	1290
Hemisphere		1450	1310
Flow		1500	1360

GUNNEDAH COAL CO LTD

Address: 69 Pitt Street
SYDNEY NSW 2000
(GPO Box 5134 Sydney 2001)

Telephone: (02) 27 4841
Telex: AA75748 (AUMSYD)
Fax: (02) 251 1269

Marketing contacts: Mr R. McCullough, *General Manager*

Typical Export Properties

	Hoskisson Coking	Melville Coking	Gunnedah Semi-Coking	Hoskisson Thermal	Melville Thermal
Total moisture (% ar)	9.5	9.5	9.5	9.5	9.5
Proximate analysis (% ad)					
Moisture	3.4	2.5	3.4	3.4	2.5
Ash	7.2	10.0	9.2	12.1	13.7
Volatile matter	35.3	35.5	34.8	32.0	32.4
Fixed carbon	54.1	52.0	52.6	52.5	51.4
Total sulphur (% ad)	0.48	0.70	0.60	0.47	0.69
Specific energy (ad)					
Gross: MJ/kg	30.84	30.73	30.06	28.72	27.92
kcal/kg	7360	7340	7180	7860	6670
Btu/lb	13260	13210	12920	12340	12000
Net: MJ/kg				27.68	26.86
kcal/kg				6610	6420
Btu/lb				11900	11550
Ultimate analysis (% daf)					
Carbon	83.0	82.8	83.5	83.3	83.3
Hydrogen	5.30	5.40	4.80	5.10	5.40
Nitrogen	1.80	2.00	1.80	1.80	1.90
Sulphur	0.50	0.80	0.70	0.60	0.80
Oxygen (diff)	9.4	9.0	9.2	9.2	8.6
Chlorine (% ad)				0.01	0.02
Phosphorus (% ad)	0.005	0.005	0.005	0.005	0.005
Size (mm)	50x0	50x0	50x0	50x0	50x0
Hardgrove grindability				50	48
Coking properties					
Crucible swelling No.	4	5	2	1	1.5
Gray King coke type	F	F	D		
Max. fluidity (ddpm)	100	1000	35		
Max. dilatation (%)	−23	+10			
Petrographic parameters					
Maceral analysis (% mmf)					
Vitrinite	55	64	45		
Semi-fusinite	24	17			
Other inertinite	16	10			
Liptinite	5	7			
R_v, max (%)	0.71	0.75			
Analysis of ash (%)					
SiO_2	61.0	60.0	58.0	60.0	62.0
Al_2O_3	23.0	33.0	21.0	21.0	30.0
Fe_2O_3	6.00	2.50	6.50	6.50	3.40
TiO_2	1.20	1.90	1.20	1.20	1.80
CaO	3.00	0.30	6.00	5.50	0.30
MgO	1.40	0.30	2.00	2.00	0.50
Na_2O	0.30	0.20	0.50	0.50	0.20
K_2O	0.20	1.30	1.00	1.00	1.40
P_2O_5	0.10	0.10	0.10	0.10	0.10
Mn_3O_4	0.10	0.10	0.10	0.10	0.10
SO_3	3.40	0.10	3.00	2.10	0.10
Ash fusion temperatures (°C)					
(reducing atmosphere)					
Deformation				1250	1500
Sphere				1280	1600
Hemisphere				1310	>1600
Flow				1380	>1600

KEMBLA COAL & COKE PTY LTD

Address: 4th Floor
Crown Central
Cnr Crown & Keira Streets
WOLLONGONG NSW 2500
(PO Box 1770)

Telephone: (042) 28 7455
Telex: AA29172 (KEMCOL)
Fax: (042) 28 4410

Marketing contacts: Mr D. Robson, *General Manager Marketing*

Typical Export Properties

	West Cliff Coking	Coal Cliff Coking	Tahmoor Coking	Tahmoor Thermal
Total moisture (% ar)	8.0	8.0	8.0	8.0
Proximate analysis (% ad)				
Moisture	1.0	1.0	1.2	1.2
Ash	9.8	9.8	8.5	13.0
Volatile matter	22.0	20.5	27.5	24.6
Fixed carbon	67.2	68.7	62.8	61.2
Total sulphur (% ad)	0.36	0.36	0.36	0.34
Specific energy (ad)				
Gross: MJ/kg	32.03	32.07	31.92	30.20
kcal/kg	7650	7660	7620	7210
Btu/lb	13770	13790	13720	12980
Net: MJ/kg				29.30
kcal/kg				7000
Btu/lb				12600
Ultimate analysis (% daf)				
Carbon	88.6	89.0	87.1	87.5
Hydrogen	4.80	4.70	5.00	4.60
Nitrogen	1.60	1.60	1.80	1.80
Sulphur	0.40	0.40	0.40	0.40
Oxygen (diff)	4.6	4.3	5.7	5.7
Chlorine (% ad)	0.01	0.01		0.02
Phosphorus (% ad)	0.069	0.050	0.050	
Size (mm)	50x0	50x0	50x0	50x0
Hardgrove grindability				58
Coking properties				
Crucible swelling No.	7	7	7	1.5
Gray King coke type	G3	G2	G5	
Max. fluidity (ddpm)	2000	1000	4000	
Max. dilatation (%)	+30	+15	+90	
Petrographic parameters				
Maceral analysis (% mmf)				
Vitrinite	52	46	53	
Semi-fusinite	38	39	24	
Other inertinite	10	14	21	
Liptinite	1	1	2	
R_v, max (%)	1.29	1.33	1.1	
Analysis of ash (%)				
SiO_2	52.2	53.8	54.4	53.1
Al_2O_3	35.9	34.5	31.0	28.5
Fe_2O_3	3.39	4.65	5.50	9.40
TiO_2	0.85	1.69	1.40	0.90
CaO	0.09	0.89	3.00	3.30
MgO	0.71	1.24	0.40	0.40
Na_2O	0.59	0.43	0.20	0.20
K_2O	1.07	0.55	0.80	0.90
P_2O_5	1.72	0.83	1.80	1.80
Mn_3O_4	0.01	0.06	0.05	0.13
SO_3	0.58	0.87	0.80	0.63
Ash fusion temperatures (°C)				
(reducing atmosphere)				
Deformation				1320
Sphere				1450
Hemisphere				1500
Flow				1530

LEMINGTON COAL MINES LTD

Address: Victoria Cross Building
60 Miller Street
NORTH SYDNEY NSW 2060
(PO Box 1439 North Sydney 2059)

Telephone: (02) 968 0000
Telex: AA26175
Fax: (02) 968 0001

Marketing contacts: Mr C Carson, *Marketing Manager*

Typical Export Properties

	Lemington Coking	Woodland Semi-Coking	Thermal
Total moisture (% ar)	8.5	9.0	9.0
Proximate analysis (% ad)			
Moisture	2.5	2.5	3.0
Ash	8.0	9.4	12.5
Volatile matter	35.0	34.1	32.5
Fixed carbon	54.4	54.0	52.0
Total sulphur (% ad)	0.35	0.40	0.43
Specific energy (ad)			
Gross: MJ/kg	30.96	30.40	29.10
kcal/kg	7400	7260	6950
Btu/lb	13310	13070	12510
Net: MJ/kg			28.02
kcal/kg			6690
Btu/lb			12050
Ultimate analysis (% daf)			
Carbon	83.7	82.1	82.1
Hydrogen	5.44	5.40	5.40
Nitrogen	1.74	1.78	1.78
Sulphur	0.39	0.45	0.51
Oxygen (diff)	8.7	10.3	10.2
Chlorine (% ad)			0.04
Phosphorus (% ad)	0.015	0.015	0.015
Size (mm)	38x0	38x0	38x0
Hardgrove grindability			50
Coking properties			
Crucible swelling No.	5.5	4	3
Gray King coke type	G1		
Max. fluidity (ddpm)	400	80	
Max. dilatation (%)	+25		
Petrographic parameters			
Maceral analysis (% mmf)			
Vitrinite	64		
Semi-fusinite	15		
Other inertinite	15		
Liptinite	4		
R_v, max (%)	0.73	0.73	
Analysis of ash (%)			
SiO_2	67.6	67.6	74.3
Al_2O_3	22.5	22.5	17.0
Fe_2O_3	4.25	4.25	3.56
TiO_2	1.18	1.18	0.75
CaO	0.77	0.77	0.94
MgO	0.56	0.56	0.63
Na_2O	0.39	0.39	0.30
K_2O	0.67	0.67	0.69
P_2O_5	0.44	0.44	0.25
Mn_3O_4	0.03	0.03	0.04
SO_3	0.69	0.69	0.17
Ash fusion temperatures (°C)			
(reducing atmosphere)			
Deformation			1440
Sphere			
Hemisphere			1530
Flow			1550

LIDDELL JOINT VENTURE

Address: Suite 2, Level 14
Norwich House
6-10 O'Connell Street
SYDNEY NSW 2000

Telephone: (02) 223 6455
Telex: AA178238 (YIELDX)
Fax: (02) 223 6524

Marketing contacts: Mr S. Gye, *General Manager Marketing*

Typical Export Properties

	Liddell A Soft Coking	Liddell B Soft Coking	Liddell Semi-Coking	Liddell Steam
Total moisture (% ar)	9.0	9.0	9.0	9.0
Proximate analysis (% ad)				
Moisture	2.5	2.5	2.5	2.5
Ash	7.0	8.0	9.8	14.0
Volatile matter	35.0	36.0	34.0	33.0
Fixed carbon	55.5	53.5	53.7	50.5
Total sulphur (% ad)	0.50	0.50	0.50	0.45
Specific energy (ad)				
Gross: MJ/kg	30.35	30.35	29.94	28.69
kcal/kg	7250	7250	7150	6850
Btu/lb	13050	13050	12870	12330
Net: MJ/kg				27.55
kcal/kg				6580
Btu/lb				11840
Ultimate analysis (% daf)				
Carbon	81.6	82.5	82.5	81.5
Hydrogen	5.83	5.90	5.90	5.83
Nitrogen	2.08	2.10	2.10	2.07
Sulphur	0.55	0.50	0.50	0.54
Oxygen (diff)	9.9	9.0	9.0	10.0
Chlorine (% ad)				0.02
Phosphorus (% ad)	0.068	0.068	0.050	0.050
Size (mm)	50x0	50x0	50x0	50x0
Hardgrove grindability				50
Coking properties				
Crucible swelling No.	7	6	4.5	3
Gray King coke type	G5	G2		
Max. fluidity (ddpm)	1000	500	150	
Max. dilatation (%)	+100	+60	+11	
Petrographic parameters				
Maceral analysis (% mmf)				
Vitrinite	83	78	72	
Semi-fusinite	9	10	19	
Other inertinite	4	5	5	
Liptinite	4	4	4	
R_v, max (%)	0.74	0.74	0.79	
Analysis of ash (%)				
SiO_2	49.0	49.0	49.0	56.6
Al_2O_3	29.0	29.0	29.0	24.7
Fe_2O_3	5.50	5.50	5.50	6.50
TiO_2	1.10	1.10	1.10	1.10
CaO	6.50	6.50	6.50	3.50
MgO	1.40	1.40	1.40	1.70
Na_2O	1.00	1.00	1.00	0.90
K_2O	0.80	0.80	0.80	1.80
P_2O_5	1.80	1.80	1.80	0.80
Mn_3O_4	0.10	0.10	0.10	0.00
SO_3	3.80	3.80	3.80	1.80
Ash fusion temperatures (°C)				
(reducing atmosphere)				
Deformation				1250
Sphere				1390
Hemisphere				1440
Flow				1500

METROPOLITAN COLLIERIES LTD

Address: Level 7, The Denison
65 Berry Street
NORTH SYDNEY NSW 2060

Telephone: (02) 956 7522
Telex: AA171069
Fax: (02) 956 7463

Marketing contacts: Mr G. Wailes, *Marketing Manager*

Typical Export Properties

	Hard Coking	Semi Coking	Premium Steam	Standard Steam
Total moisture (% ar)	9.0	8.0	7.0	7.0
Proximate analysis (% ad)				
Moisture	1.0	1.0	1.0	1.0
Ash	9.8	11.5	11.5	15.0
Volatile matter	21.5	21.0	21.0	20.0
Fixed carbon	67.7	66.5	66.5	64.0
Total sulphur (% ad)	0.54	0.53	0.45	0.45
Specific energy (ad)				
Gross: MJ/kg	31.19	31.19	30.98	29.84
kcal/kg	7450	7450	7400	7130
Btu/lb	13410	13410	13320	12830
Net: MJ/kg			30.07	28.97
kcal/kg			7180	6920
Btu/lb			12930	12450
Ultimate analysis (% daf)				
Carbon	90.0	90.0	90.0	90.0
Hydrogen	4.60	4.60	4.60	4.60
Nitrogen	1.60	1.60	1.60	1.60
Sulphur	0.60	0.60	0.51	0.54
Oxygen (diff)	3.2	3.2	3.3	3.3
Chlorine (% ad)	0.02	0.02	0.02	0.02
Phosphorus (% ad)	0.050	0.050	0.050	0.050
Size (mm)	32x0	50x0	50x0	50x0
Hardgrove grindability			70	70
Coking properties				
Crucible swelling No.	6	4	3	1.5
Gray King coke type	F	F		
Max. fluidity (ddpm)	500	100		
Max. dilatation (%)		–22		
Petrographic parameters				
Maceral analysis (% mmf)				
Vitrinite	30	30		
Semi-fusinite	43	43		
Other inertinite	22	22		
Liptinite				
R_v, max (%)	1.31	1.31		
Analysis of ash (%)				
SiO_2	49.5	49.5	49.5	49.5
Al_2O_3	36.0	36.0	36.0	36.0
Fe_2O_3	4.70	4.70	4.70	4.70
TiO_2	3.50	3.50	1.40	1.40
CaO	1.90	1.90	3.50	3.50
MgO	1.40	1.40	1.90	1.90
Na_2O	0.40	0.40	0.40	0.40
K_2O	0.80	0.80	0.80	0.80
P_2O_5	1.20	1.20	1.20	1.20
Mn_3O_4	0.10	0.10	0.10	0.10
SO_3	0.30	0.30	0.30	0.30
Ash fusion temperatures (°C)				
(reducing atmosphere)				
Deformation				
Sphere				
Hemisphere				
Flow			>1600	1600

MUSWELLBROOK COAL CO LTD

Address: 32-34 Queen Street
MUSWELLBROOK NSW 2333
(PO Box 123)

Telephone: (065) 43 2799
Telex: AA163821 (MUSCOL)
Fax: (065) 42 5010

Marketing contacts: Mr M Smith, *General Manager*

Typical Export Properties

	Tiger Het Steam A	Tiger Het Steam B	Tiger Het Steam C	Tiger Het Steam D
Total moisture (% ar)	9.0	9.0	9.0	9.0
Proximate analysis (% ad)				
Moisture	2.5	2.5	2.5	2.5
Ash	10.6	11.5	12.5	16.0
Volatile matter	34.5	34.5	34.0	32.0
Fixed carbon	52.4	51.5	51.0	49.5
Total sulphur (% ad)	0.99	0.99	0.99	0.99
Specific energy (ad)				
Gross: MJ/kg	29.64	29.10	28.68	27.21
kcal/kg	7080	6950	6850	6500
Btu/lb	12740	12510	12330	11700
Net: MJ/kg	28.61	28.07	27.67	26.24
kcal/kg	6830	6700	6610	6270
Btu/lb	12300	12070	11890	11280
Ultimate analysis (% daf)				
Carbon	80.5	81.7	81.3	81.0
Hydrogen	5.08	5.08	5.08	5.08
Nitrogen	1.90	1.60	1.60	1.60
Sulphur	1.14	1.19	1.16	1.21
Oxygen (diff)	11.4	10.4	10.9	11.1
Chlorine (% ad)	0.02	0.02	0.02	0.02
Phosphorus (% ad)	0.023	0.023	0.023	0.023
Size (mm)	50x0	50x0	50x0	50x0
Hardgrove grindability	45	45	45	45
Coking properties				
Crucible swelling No.	1	1	1	1
Gray King coke type				
Max. fluidity (ddpm)				
Max. dilatation (%)				
Petrographic parameters				
Maceral analysis (% mmf)				
Vitrinite				
Semi-fusinite				
Other inertinite				
Liptinite				
R_v, max (%)				
Analysis of ash (%)				
SiO_2	52.0	52.0	52.0	52.0
Al_2O_3	33.2	33.2	33.2	33.2
Fe_2O_3	8.90	8.90	8.90	8.90
TiO_2	2.33	2.33	2.33	2.33
CaO	0.64	0.64	0.64	0.64
MgO	0.35	0.35	0.35	0.35
Na_2O	0.30	0.30	0.30	0.30
K_2O	0.88	0.88	0.88	0.88
P_2O_5	0.88	0.88	0.88	0.88
Mn_3O_4	0.03	0.03	0.03	0.03
SO_3	0.15	0.15	0.15	0.15
Ash fusion temperatures (°C)				
(reducing atmosphere)				
Deformation	1300	1300	1300	1300
Sphere				
Hemisphere				
Flow	>1550	>1550	>1550	>1550

THE NEWCASTLE WALLSEND COAL CO PTY LTD

Address: PWCS Ltd, Admin Building
Port Waratah Drive
CARRINGTON NSW 2294
(PO Box 2)

Telephone: (049) 69 1888
Telex: AA28284
Fax: (049) 69 3712

Marketing contacts: Mr R Littlewood, *Marketing Manager*

Typical Export Properties

	Daiyon Soft Coking	Ellalong Low Ash Coking	Semi Coking	Thermal
Total moisture (% ar)	8.3	8.0	8.0	8.0
Proximate analysis (% ad)				
Moisture	2.5	2.1	2.8	2.8
Ash	7.4	5.7	9.6	15.9
Volatile matter	37.5	40.3	35.9	32.5
Fixed carbon	52.6	51.9	51.7	48.8
Total sulphur (% ad)	0.72	0.85	0.65	0.52
Specific energy (ad)				
Gross: MJ/kg	31.65	32.43	30.68	28.13
kcal/kg	7560	7750	7330	6720
Btu/lb	13610	13940	13190	12090
Net: MJ/kg				27.05
kcal/kg				6460
Btu/lb				11630
Ultimate analysis (% daf)				
Carbon	83.4	83.6	83.0	83.0
Hydrogen	5.80	5.99	5.70	5.62
Nitrogen	2.04	2.08	1.90	1.97
Sulphur	0.78	0.92	0.74	0.64
Oxygen (diff)	8.0	7.4	8.7	8.8
Chlorine (% ad)				0.02
Phosphorus (% ad)	0.039	0.023	0.047	0.058
Size (mm)	50x0	50x0	50x0	50x0
Hardgrove grindability				48
Coking properties				
Crucible swelling No.	6	6	4.5	4
Gray King coke type	G5	G5	G3	
Max. fluidity (ddpm)	2600	>5000	600	
Max. dilatation (%)	+30	+40	+20	
Petrographic parameters				
Maceral analysis (% mmf)				
Vitrinite	66	64	67	
Semi-fusinite	7	7	8	
Other inertinite	14	18	16	
Liptinite	9	11	9	
R_v, max (%)	0.72	0.67	0.74	
Analysis of ash (%)				
SiO_2	57.0	51.5	59.5	68.3
Al_2O_3	29.0	32.9	27.5	23.0
Fe_2O_3	4.30	5.20	4.10	2.90
TiO_2	1.40	1.80	1.30	1.00
CaO	3.00	2.50	2.50	1.40
MgO	0.90	1.00	0.70	0.70
Na_2O	1.20	1.60	1.00	0.70
K_2O	1.00	0.90	1.10	1.50
P_2O_5	1.22	0.95	1.10	0.84
Mn_3O_4	0.04	0.04	0.03	0.03
SO_3	1.29	1.68	1.10	0.53
Ash fusion temperatures (°C)				
(reducing atmosphere)				
Deformation				1260
Sphere				1520
Hemisphere				1530
Flow				1550

NOVACOAL AUSTRALIA PTY LTD

Address: 110 Alfred Street
MILSONS POINT NSW 2061
(PO Box 354)

Telephone: (02) 900 0444
Telex: AA20311
Fax: (02) 959 4197

Marketing contacts: Mr E Buller, *Coal Marketing Manager*

Typical Export Properties

	Newdell Soft Coking	Newdell Semi-Coking	Northern Thermal A	Northern Thermal B
Total moisture (% ar)	8.0	8.0	9.0	9.0
Proximate analysis (% ad)				
Moisture	2.5	3.0	3.0	3.0
Ash	8.0	9.5	10.0	12.0
Volatile matter	37.0	36.1	35.8	34.0
Fixed carbon	52.5	51.4	51.2	51.0
Total sulphur (% ad)	0.55	0.55	0.58	0.62
Specific energy (ad)				
Gross: MJ/kg	31.00	31.00	29.70	29.11
kcal/kg	7400	7400	7090	6950
Btu/lb	13330	13330	12770	12510
Net: MJ/kg			28.53	27.96
kcal/kg			6820	6680
Btu/lb			12270	12020
Ultimate analysis (% daf)				
Carbon	82.8	82.8	82.0	82.8
Hydrogen	5.70	5.70	5.70	5.70
Nitrogen	1.90	1.90	1.90	1.90
Sulphur	0.60	0.60	0.70	0.70
Oxygen (diff)	9.0	9.0	9.7	8.8
Chlorine (% ad)	0.03		0.04	0.03
Phosphorus (% ad)	0.020	0.020	0.020	0.020
Size (mm)	50x0	50x0	50x0	50x0
Hardgrove grindability			48	48
Coking properties				
Crucible swelling No.	5	3	3	3
Gray King coke type	G3	G2		
Max. fluidity (ddpm)	200	100		
Max. dilatation (%)	+50	+40		
Petrographic parameters				
Maceral analysis (% mmf)				
Vitrinite	76	76		
Semi-fusinite	9	9		
Other inertinite	10	10		
Liptinite	5	5		
R_v, max (%)	0.7	0.7		
Analysis of ash (%)				
SiO_2	58.0	58.0	59.8	62.5
Al_2O_3	29.0	29.0	27.7	27.7
Fe_2O_3	4.00	4.00	4.40	4.00
TiO_2	1.70	1.70	1.60	1.30
CaO	2.30	2.30	2.00	0.70
MgO	1.00	1.00	1.00	0.80
Na_2O	0.40	0.40	0.50	0.30
K_2O	0.90	0.90	1.10	1.10
P_2O_5	0.40	0.40	0.30	0.30
Mn_3O_4	0.04	0.04	0.03	0.02
SO_3	0.70	0.70	0.80	0.70
Ash fusion temperatures (°C)				
(reducing atmosphere)				
Deformation			1400	1400
Sphere			1470	1500
Hemisphere			>1560	>1560
Flow			>1560	>1560

NOVACOAL AUSTRALIA PTY LTD (continued)

Typical Export Properties

	Western Thermal	Vickery Thermal
Total moisture (% ar)	9.0	10.0
Proximate analysis (% ad)		
Moisture	2.5	3.5
Ash	14.0	9.0
Volatile matter	29.0	33.5
Fixed carbon	54.5	54.0
Total sulphur (% ad)	0.58	0.40
Specific energy (ad)		
Gross: MJ/kg	28.34	30.14
kcal/kg	6770	7200
Btu/lb	12190	12960
Net: MJ/kg	27.38	29.03
kcal/kg	6540	6940
Btu/lb	11770	12480
Ultimate analysis (% daf)		
Carbon	84.2	82.0
Hydrogen	4.90	5.30
Nitrogen	1.50	1.80
Sulphur	0.70	0.50
Oxygen (diff)	8.7	10.4
Chlorine (% ad)	0.01	0.05
Phosphorus (% ad)	0.010	0.005
Size (mm)	50x0	35x0
Hardgrove grindability	49	50
Coking properties		
Crucible swelling No.	0.5	1
Gray King coke type		
Max. fluidity (ddpm)		
Max. dilatation (%)		
Petrographic parameters		
Maceral analysis (% mmf)		
Vitrinite		
Semi-fusinite		
Other inertinite		
Liptinite		
R_v, max (%)		
Analysis of ash (%)		
SiO_2	61.4	69.3
Al_2O_3	31.3	23.1
Fe_2O_3	1.60	2.08
TiO_2	1.40	1.26
CaO	0.40	0.52
MgO	0.30	0.41
Na_2O	0.10	0.34
K_2O	3.20	1.33
P_2O_5	0.13	0.09
Mn_3O_4	0.02	0.01
SO_3	0.10	0.26
Ash fusion temperatures (°C)		
(reducing atmosphere)		
Deformation	1500	1370
Sphere	>1560	>1500
Hemisphere	>1560	>1500
Flow	>1560	>1500

SAXONVALE COAL PTY LTD

Address: PWCS Ltd, Admin Building
Port Waratah Drive
CARRINGTON NSW 2294
(PO Box 2)

Telephone: (049) 69 3733
Telex: AA28284
Fax: (049) 69 3712

Marketing contacts: Mr P Macpherson, *Marketing Manager*

Typical Export Properties

		Saxonvale Steam
Total moisture (% ar)		9.0
Proximate analysis (% ad)		
Moisture		3.3
Ash		15.9
Volatile matter		28.7
Fixed carbon		52.1
Total sulphur (% ad)		0.45
Specific energy (ad)		
Gross:	MJ/kg	27.82
	kcal/kg	6640
	Btu/lb	11960
Net:	MJ/kg	26.81
	kcal/kg	6400
	Btu/lb	11530
Ultimate analysis (% daf)		
Carbon		84.2
Hydrogen		5.20
Nitrogen		1.76
Sulphur		0.56
Oxygen (diff)		8.3
Chlorine (% ad)		0.02
Phosphorus (% ad)		0.006
Size (mm)		50x0
Hardgrove grindability		53
Coking properties		
Crucible swelling No.		2.5
Gray King coke type		
Max. fluidity (ddpm)		
Max. dilatation (%)		
Petrographic parameters		
Maceral analysis (% mmf)		
Vitrinite		
Semi-fusinite		
Other inertinite		
Liptinite		
R_v, max (%)		
Analysis of ash (%)		
SiO_2		72.5
Al_2O_3		20.0
Fe_2O_3		3.40
TiO_2		0.90
CaO		0.40
MgO		0.40
Na_2O		0.30
K_2O		2.00
P_2O_5		0.08
Mn_3O_4		0.05
SO_3		0.20
Ash fusion temperatures (°C)		
(reducing atmosphere)		
Deformation		1240
Sphere		>1550
Hemisphere		>1550
Flow		>1550

ULAN COAL MINES LTD

Address: Victoria Cross Building
60 Miller Street
NORTH SYDNEY NSW 2060
(PO Box 1059 North Sydney 2059)

Telephone: (02) 922 4000
Telex: AA71492 (ULAN)
Fax: (02) 959 4619

Marketing contacts: Mr D Dawkins, *Marketing Manager*

Typical Export Properties

	Ulan 'A' Steam	Ulan 'B' Steam
Total moisture (% ar)	9.5	9.5
Proximate analysis (% ad)		
Moisture	2.5	2.5
Ash	12.5	17.5
Volatile matter	31.5	30.0
Fixed carbon	53.5	50.0
Total sulphur (% ad)	0.82	0.70
Specific energy (ad)		
Gross: MJ/kg	29.10	27.63
kcal/kg	6950	6600
Btu/lb	12510	11880
Net: MJ/kg	28.06	26.66
kcal/kg	6700	6370
Btu/lb	12060	11460
Ultimate analysis (% daf)		
Carbon	84.1	84.1
Hydrogen	5.20	5.20
Nitrogen	1.60	1.60
Sulphur	0.96	0.87
Oxygen (diff)	8.1	8.2
Chlorine (% ad)	0.02	0.02
Phosphorus (% ad)	0.010	0.010
Size (mm)	50x0	50x0
Hardgrove grindability	50	47
Coking properties		
Crucible swelling No.	1	1
Gray King coke type		
Max. fluidity (ddpm)		
Max. dilatation (%)		
Petrographic parameters		
Maceral analysis (% mmf)		
Vitrinite		
Semi-fusinite		
Other inertinite		
Liptinite		
R_v, max (%)		
Analysis of ash (%)		
SiO_2	78.0	78. 0
Al_2O_3	16.0	16.0
Fe_2O_3	3.30	3.30
TiO_2	0.60	0.60
CaO	0.20	0.20
MgO	0.20	0.20
Na_2O	0.10	0.10
K_2O	0.30	0.30
P_2O_5	0.10	0.10
Mn_3O_4	0.10	0.10
SO_3	0.10	0.10
Ash fusion temperatures (°C)		
(reducing atmosphere)		
Deformation	1400	1400
Sphere	1460	1460
Hemisphere	1500	1500
Flow	>1600	>1600

UNITED COLLIERIES PTY LTD

Address: Jerry's Plains Road
SINGLETON NSW 2330
(PO Box 478)

Telephone: (065) 74 4502
Telex: AA72020
Fax: (065) 74 4606

Marketing contacts: Mr I. Stevenson, *General Manager*

Typical Export Properties

	Coking A	Coking B	Thermal A	Thermal B
Total moisture (% ar)	8.0	8.0	9.0	9.0
Proximate analysis (% ad)				
Moisture	2.3	4.1	2.1	5.0
Ash	7.5	7.5	8.0	13.2
Volatile matter	32.0	37.0	35.0	30.4
Fixed carbon	58.2	51.4	54.9	51.4
Total sulphur (% ad)	0.31	0.30	0.31	0.52
Specific energy (ad)				
Gross: MJ/kg	30.48	30.38	31.85	28.28
kcal/kg	7280	7260	7610	6760
Btu/lb	13100	13060	13690	12160
Net: MJ/kg			30.69	27.23
kcal/kg			7330	6500
Btu/lb			13190	11700
Ultimate analysis (% daf)				
Carbon	83.5	82.5	83.5	81.2
Hydrogen	5.59	5.59	5.59	5.16
Nitrogen	1.76	1.76	1.76	1.92
Sulphur	0.34	0.34	0.34	0.64
Oxygen (diff)	8.8	9.8	8.8	11.1
Chlorine (% ad)			0.01	0.01
Phosphorus (% ad)	0.002	0.013	0.002	0.015
Size (mm)	50x0	50x0	50x0	50x0
Hardgrove grindability			47	47
Coking properties				
Crucible swelling No.	6	3	2	3
Gray King coke type	G4	D		
Max. fluidity (ddpm)	560	60		
Max. dilatation (%)	+8	−40		
Petrographic parameters				
Maceral analysis (% mmf)				
Vitrinite	70	50		
Semi-fusinite				
Other inertinite				
Liptinite				
R_v, max (%)	0.77	0.65		
Analysis of ash (%)				
SiO_2	62.6	62.6	62.6	62.6
Al_2O_3	27.3	27.3	27.3	27.3
Fe_2O_3	2.93	2.93	2.93	2.93
TiO_2	1.25	1.25	1.25	1.25
CaO	1.51	1.51	1.51	1.51
MgO	1.26	1.26	1.26	1.26
Na_2O	0.74	0.74	0.74	0.74
K_2O	1.22	1.22	1.22	1.22
P_2O_5	0.11	0.11	0.11	0.11
Mn_3O_4	0.02	0.02	0.02	0.02
SO_3	1.08	1.08	1.08	1.08
Ash fusion temperatures (°C)				
(reducing atmosphere)				
Deformation			1110	1110
Sphere				
Hemisphere				
Flow			>1600	>1560

WAMBO MINING CORPORATION PTY LTD

Address: 7th Floor,
83 Clarence Street
SYDNEY NSW 2000
(P.O. Box N324 Grosvenor Place)

Telephone: (02) 290 2666
Telex:
Fax: (02) 290 2828

Marketing contacts: Mr R G Davies, *Marketing Manager*

Typical Export Properties

	Soft Coking	Semi-Soft Coking	Supa-Cal Steam	Hi-Cal Steam	Standard Steam
Total moisture (% ar)	9.0	9.0	9.0	9.0	9.0
Proximate analysis (% ad)					
Moisture	3.0	3.0	2.5	2.5	2.5
Ash	7.3	9.5	9.5	11.0	12.0
Volatile matter	36.0	34.0	34.0	33.5	33.0
Fixed carbon	53.7	53.5	54.0	53.0	52.5
Total sulphur (% ad)	0.58	0.46	0.47	0.50	0.60
Specific energy (ad)					
Gross: MJ/kg	30.60	29.65	29.94	29.31	28.47
kcal/kg	7310	7080	7150	7000	6800
Btu/lb	13150	12750	12870	12600	12240
Net: MJ/kg			28.84	28.23	27.39
kcal/kg			6890	6740	6540
Btu/lb			12400	12140	11780
Ultimate analysis (% daf)					
Carbon	82.0	82.4	82.4	82.4	82.5
Hydrogen	5.50	5.34	5.34	5.34	5.41
Nitrogen	1.90	2.04	2.02	2.02	2.04
Sulphur	0.65	0.53	0.57	0.58	0.70
Oxygen (diff)	10.0	9.7	9.7	9.7	9.5
Chlorine (% ad)			0.02	0.02	0.03
Phosphorus (% ad)	0.007	0.029	0.029	0.029	0.029
Size (mm)		50x0	50x0	50x0	50x0
Hardgrove grindability			52	50	0.70
Coking properties					
Crucible swelling No.	5	4	3	3	2
Gray King coke type	G	F			
Max. fluidity (ddpm)	10	9			
Max. dilatation (%)	−17	−35			
Petrographic parameters					
Maceral analysis (% mmf)					
Vitrinite	75	74			
Semi-fusinite	6	6			
Other inertinite	11	9			
Liptinite	5	9			
R_v, max (%)	0.72	0.75			
Analysis of ash (%)					
SiO_2	62.9	68.4	68.4	68.4	71.9
Al_2O_3	25.4	17.0	17.0	17.0	15.2
Fe_2O_3	4.15	4.25	4.25	4.25	3.85
TiO_2	1.21	0.72	0.72	0.72	0.63
CaO	1.40	2.92	2.92	2.92	2.57
MgO	1.05	1.51	1.51	1.51	1.43
Na_2O	0.97	0.88	0.88	0.88	0.85
K_2O	1.52	0.65	0.65	0.65	0.64
P_2O_5	0.09	0.68	0.68	0.68	0.53
Mn_3O_4	0.02	0.02	0.02	0.02	0.02
SO_3	1.07	2.06	2.06	2.06	1.85
Ash fusion temperatures (°C)					
(reducing atmosphere)					
Deformation			1325	1325	1300
Sphere			1385	1385	
Hemisphere			1405	1405	1400
Flow			1465	1465	

WARKWORTH MINING LTD

Address: 2 Dind Street
MILSONS POINT NSW 2061
(PO Box 231)

Telephone: (02) 922 6444
Telex: AA122352 (COSDOWN)
Fax: (02) 959 5418

Marketing contacts: Mr K Davies, *Marketing Manager*

Typical Export Properties

	Soft Coking	Semi-Soft Coking	Steam
Total moisture (% ar)	8.0	8.0	8.0
Proximate analysis (% ad)			
Moisture	2.5	2.5	2.5
Ash	7.5	9.5	15.0
Volatile matter	36.0	34.5	29.0
Fixed carbon	54.0	53.5	53.5
Total sulphur (% ad)	0.49	0.48	0.58
Specific energy (ad)			
Gross: MJ/kg	31.61	30.14	28.47
kcal/kg	7550	7200	6800
Btu/lb	13590	12960	12240
Net: MJ/kg			27.44
kcal/kg			6550
Btu/lb			11800
Ultimate analysis (% daf)			
Carbon	84.0	84.8	82.8
Hydrogen	5.63	5.67	5.32
Nitrogen	1.84	1.77	1.77
Sulphur	0.54	0.55	0.70
Oxygen (diff)	8.0	7.2	9.4
Chlorine (% ad)			0.03
Phosphorus (% ad)	0.005	0.005	0.008
Size (mm)	50x0	50x0	40x0
Hardgrove grindability			52
Coking properties			
Crucible swelling No.	6	4.5	4
Gray King coke type	G3	G1	
Max. fluidity (ddpm)	800	200	
Max. dilatation (%)	+20	+5	
Petrographic parameters			
Maceral analysis (% mmf)			
Vitrinite	75	58	
Semi-fusinite	8	20	
Other inertinite	4	11	
Liptinite	6	7	
R_v, max (%)	0.75	0.75	
Analysis of ash (%)			
SiO_2	63.5	69.8	75.0
Al_2O_3	29.5	24.2	18.5
Fe_2O_3	1.94	2.20	2.50
TiO_2	1.28	1.30	1.32
CaO	0.64	0.40	0.16
MgO	0.44	0.40	0.35
Na_2O	0.30	0.24	0.18
K_2O	0.77	0.60	0.44
P_2O_5	0.15	0.10	0.06
Mn_3O_4	0.01	0.01	0.00
SO_3	1.17	0.60	0.01
Ash fusion temperatures (°C)			
(reducing atmosphere)			
Deformation			1440
Sphere			>1550
Hemisphere			>1550
Flow			>1550